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S. HRG. 113–410

NOMINATIONS FOR THE OFFICE OF SCIENCE AND TECHNOLOGY POLICY AND THE NATIONAL OCEANOGRAPHIC AND ATMOSPHERIC ADMINISTRATION

HEARING

BEFORE THE

COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION UNITED STATES SENATE

ONE HUNDRED THIRTEENTH CONGRESS

FIRST SESSION

SEPTEMBER 19, 2013

Printed for the use of the Committee on Commerce, Science, and Transportation

U.S. GOVERNMENT PRINTING OFFICE
89–894 PDF WASHINGTON : 2014

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ONE HUNDRED THIRTEENTH CONGRESS

FIRST SESSION

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Rebecca Seidel, *Republican General Counsel and Chief Investigator*

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NOMINATIONS FOR THE OFFICE OF SCIENCE AND TECHNOLOGY POLICY AND THE NATIONAL OCEANOGRAPHIC AND ATMOSPHERIC ADMINISTRATION

THURSDAY, SEPTEMBER 19, 2013

U.S. SENATE,
COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION,
Washington, DC.

The Committee met, pursuant to notice, at 10 a.m., in room SR–253, Russell Senate Office Building, Hon. Bill Nelson, presiding.

OPENING STATEMENT OF HON. BILL NELSON, U.S. SENATOR FROM FLORIDA

Senator NELSON. Good morning. Senator Thune will be here momentarily. I want to go ahead and get some of the preliminaries out. We have a panel of very distinguished folks and this Committee meets to consider their nominations for three very important positions.

Bob Simon, of Maryland, to be Associate Director for Energy, Environment, Office of Science and Technology policy. Second, Jo Handelsman, of Connecticut, to be Associate Director for Science at the Office of Science and Technology Policy. And Kathy Sullivan, of Virginia, to be Under Secretary of Commerce for Oceans and Atmosphere and Administrator of the National Oceanographic and Atmospheric Administration. Henceforth, I shall use acronyms, NOAA, OSTP, etc.

Dr. Simon is what we call a Senate graduate. He served honorably the Senate for the last 20 years and has been most recently Staff Director for the Senate Energy and Natural Resources Committee for then Chairman Jeff Bingaman. As Staff Director, Dr. Simon shepherded two major bipartisan energy bills, the Energy Policy Act of 2005 and the Energy Independence and Security Act of 2007, through Congress. That may have been about the last thing to have passed the Congress.

In addition to his many accolades in science and clean energy and technology fields, Dr. Simon was known to be a mentor and role model to the staff and a trusted advisor to the members of the Committee.

Dr. Handelsman has been a professor of molecular, cellular, and developmental biology at Yale and in that position since 2010. She is also the current President of the American Society of Microbiology. She previously served as faculty, including the Department Chair of the Department of Bacteriology at the University of Wisconsin, Madison. She received her Bachelor's from Cornell and her Ph.D. from Wisconsin Medicine.

Dr. Kathy Sullivan is the current Acting Administrator of NOAA and has held this position since February. As an oceanographer and an astronaut, she represents both the oceans and the sky, both sides of NOAA. She holds a Bachelor's degree in Earth Sciences from University of California Santa Cruz, a Doctorate in Geology from Dalhousie University. Dr. Sullivan made many trips to have discussions with me on important issues on the RESTORE Act, which includes trying to take care of the fish, and also many discussions on weather satellites.

She also has the unique position, as an astronaut, of having done what are termed, another acronym, EVAs, which is a spacewalk watching earth from that perspective of only being tethered by a small little line.

So all of you, I look forward to the confirmation by the Senate of your nominations. I don't think we'll have any problem, unless— well, you never can tell around here. So what I'd like to do, in the order that I introduced you, I would like you all to take a little capsule of less than five minutes to share with us, for the record. And what we will do, of course, is to put your written statement into the record. So let's start with you, Dr. Simon.

STATEMENT OF DR. ROBERT M. SIMON, NOMINEE TO BE ASSOCIATE DIRECTOR FOR ENERGY AND ENVIRONMENT, OFFICE OF SCIENCE AND TECHNOLOGY POLICY

Dr. SIMON. Well, thank you very much, Chairman Nelson and Senator Heinrich and other members of the Committee. I'm pleased to be here today to be the President's nominee to be the Associate Director for Environment and Energy at the Office of Science Technology Policy. Thank you for making my full submitted statement part of the Committee's record and I will make, I think, three brief comments and then I will be happy to answer any questions you or other members of the Committee may have to the best of my ability.

First of all, let me say that I am deeply honored by the President's decision to propose me for this position. As you mentioned, I spent the last 20 years of my life here in the Senate, working first for Senator J. Bennett Johnston of Louisiana and then for 16 years with Senator Jeff Bingaman from New Mexico.

And at one point, I was in the Stennis Fellows Program and I vividly remember the first meeting of Stennis Fellows. Someone got up and said, "you know, sometimes when I walk out of the office at night, I look up and I see the Capitol dome, all lit up. And then it hits me, I can't believe I am so privileged to actually be able to work here at the seat of our national government."

And when he said that, I looked around the room at the other Stennis Fellows and every staffer, every head of every staffer, Democrat, Republican, House, Senate, nodding up and down, yes, we know that experience. We've had that, too. And so I feel incredibly privileged that I have this additional opportunity for public service as an OSTP Associate Director. I look forward to working with Dr. John Holdren, the President's science advisor, with colleagues in the Executive Branch, and with all of you here, on both sides of the aisle, on the important issues before us.

Second, I would like to acknowledge the help, support, mentoring and assistance of many people in my life without whom I wouldn't even be here today. They include, first of all, my wonderful family who is sitting behind me, but also many great teachers, mentors, professional colleagues, and friends over the years.

Finally, let me observe that the Office of Science and Technology Policy is kind of an interesting beast. It doesn't actually have any line authority over Federal agencies or regulatory bodies. OSTP's job is actually to work cooperatively with other elements of the Executive Office of the President, with Federal departments and agencies and with the Congress, as these other organizations exercise their roles and responsibilities in the policy development process.

OSTP can use the power of science and technology to be a constructive influence and that's very important. As an observer of OSTP over the years, I've admired its abilities to convene disparate agencies, to combine their information with the best other scientific insights available, and to help shape appropriate and technically sound policy outcomes.

I hope I can contribute to that work, if confirmed. And I would be honored to be given that opportunity by the Senate. Thank you.

[The prepared statement and biographical information of Dr. Simon follow:]

PREPARED STATEMENT OF ROBERT M. SIMON, NOMINEE TO BE ASSOCIATE DIRECTOR, ENVIRONMENT AND ENERGY, OFFICE OF SCIENCE AND TECHNOLOGY POLICY, EXECUTIVE OFFICE OF THE PRESIDENT

Chairman Rockefeller, Ranking Member Thune, and members of the Committee, I am pleased to be here today as President Obama's nominee to be the Associate Director for Environment and Energy at the Office of Science and Technology Policy (OSTP). I am deeply honored by the President's decision to propose me for this position. If confirmed by the Senate, I will look forward to assisting Dr. John Holdren, the President's science and technology advisor, and working with other members of the staff in the Executive Office of the President, as well as with the Congress.

I would not be here today, but for the help, support, and guidance of many mentors, colleagues, members of my family, and friends.

I had the good fortune to have two engineers as parents. Not many people my age can boast of having an engineer for a mother. My mother, in fact, was the first woman to graduate with a chemical engineering degree from the night school at Drexel Institute of Technology in Philadelphia in the early 1950s. Training for engineering as a woman back then was not easy—growing up, I heard stories from time to time of professors who were less than helpful to female students studying engineering. One response to those challenges was the decision by my mother and her friends to start the Society of Women Engineers at Drexel in 1949. More than six decades later, the Society has more than 20,000 members representing all areas of engineering and many areas of technology. The Society encourages girls, starting as early as elementary school, to aspire to be engineers. It maintains the crucial networks of support and mentoring so necessary to any effort to broaden participation by women in science, technology, engineering, and mathematics, or STEM, careers.

My late father was also a source of inspiration—with the optimistic, can-do nature most good engineers demonstrate in the face of challenges, as well as a keen appreciation that sometimes solutions can be over-engineered. One of his humorous observations, which I found, during my time in the Senate, often applied to legislation as well, was that "if you keep improving something long enough, eventually it will break."

I went to a high school with an excellent science program. While I was there in the early 1970s, I led a number of students who worked with the faculty to develop an outdoor environmental education unit for middle-school students. In college and graduate school, I trained in chemistry, a core scientific discipline for environmental and energy issues. My first professional career experiences in Washington were at the National Research Council of the National Academies of Sciences and Engineering, where I directed the process of developing technical consensus around science, engineering, and energy policy issues.

When I went to the Department of Energy in 1989, I had the good fortune to work directly for the Secretary of Energy, Admiral James D. Watkins. In that capacity, I was also able to see how technical information was used in the formulation and execution of energy and environmental policy. After successfully establishing the Secretary of Energy Advisory Board and directing its first set of studies, I was promoted into a more responsible position in the senior line management of the Office of Energy Research. There I learned more about scientific program management and the organizational and budgetary challenges that must be met in order to successfully manage programs and projects.

In June 1993, the Chairman of the Senate Energy and Natural Resources Committee, Sen. J. Bennett Johnston, requested that I be detailed to the Committee as a science expert. For the next 20 years, I served at the interface of science, engineering, and public policy in a number of positions in the Senate. These included serving on the staff of the Committee on Energy and Natural Resources under Chairman Johnston; a stint in Senator Jeff Bingaman's personal office; a year on the staff of the Joint Economic Committee; and, finally, 14 years as the Democratic Staff Director of the Energy Committee. Together these positions gave me a strong understanding of how public policy in energy and environmental areas can be successfully crafted, on a bipartisan basis, through legislation. I had the good fortune of working for two Members who exemplified substantive, constructive, and bipartisan approaches to important policy issues. I also spent about half of my time in the Senate in the majority and the other half in the minority, so I gained a good appreciation of how the policy process looks from both vantage points.

Should the Senate confirm me for the OSTP Associate Director position, I would welcome the opportunity to apply what I have learned over the course of my career to carry out the duties of a position that is entrusted with the development and reasoned application of scientific and technical information to the public policy process at its highest level in the Executive Branch.

My career has been motivated from the beginning by an interest in public service. I hope to be able to continue helping formulate sensible approaches to crucial national and international challenges in the areas of energy and the environment. While the prospect of addressing these complex challenges in a manner that develops long-term social and political consensus is daunting, I cannot think of a more important set of issues to which I could make a substantive contribution.

Thank you for the opportunity to testify on my nomination this morning. I appreciate the consideration that you will give to it and I look forward to answering any questions you may have.

A. BIOGRAPHICAL INFORMATION

1. Name (Include any former names or nicknames used): Robert Michael Simon (also known as Bob Simon).

2. Position to which nominated: Associate Director for Environment and Energy, Office of Science and Technology Policy, Executive Office of the President.

3. Date of Nomination: July 25, 2013.

4. Address (List current place of residence and office addresses):

Home: Information not released to the public.
Office: Eisenhower Executive Office Building, 1650 Pennsylvania Avenue, N.W., Washington, D.C. 20504.

5. Date and Place of Birth: January 12, 1956; Philadelphia, Pennsylvania.

6. Provide the name, position, and place of employment for your spouse (if married) and the names and ages of your children (including stepchildren and children by a previous marriage).

Spouse: Karen M. Simon, homemaker. Children: Stephen F. Simon, age 28; Cathryn M. Simon, age 24; Anne-Marie W. Simon, age 18; Gregory R. Simon (deceased).

7. List all college and graduate degrees. Provide year and school attended.

B.S., Chemistry, Ursinus College, 1977
Ph.D., Inorganic Chemistry, Massachusetts Institute of Technology, 1982

8. List all post-undergraduate employment, and highlight all management-level jobs held and any non-managerial jobs that relate to the position for which you are nominated.

Massachusetts Institute of Technology (Cambridge, MA), Department of Chemistry

Graduate Student—Research Assistant, September 1977–March 1982

National Research Council (Washington, D.C.), Board on Chemical Sciences and Technology

Mellon Foundation Postdoctoral Fellow in Science Policy, March 1982–August 1983

Staff Officer, September 1983–September 1985

Senior Staff Officer and Associate Director, October 1985–January 1987

Acting Staff Director, February 1987–December 1987

Staff Director, January 1988–0ctober 1989

National Research Council (Washington, D.C.), Commission on Physical Sciences, Mathematics, and Resources

Acting Associate Executive Director, April 1989–0ctober 1989

U.S. Department of Energy, Office of the Secretary of Energy Advisory Board
Expert (temporary appointment as a Special Government Employee), October 1989–July 1990

Executive Director, July 1990–March 1992

U.S. Department of Energy, Office of Energy Research

Principal Deputy Director, October 1991–June 1993

United States Senate, Committee on Energy and Natural Resources (On detail from the U.S. Department of Energy)

Science Fellow, June 1993–January 1997

United States Senate, Office of Senator Jeff Bingaman (D—New Mexico) (On detail from the U.S. Department of Energy)

Science and Technology Advisor, January 1997–January 1998

Congress of the United States, Joint Economic Committee

Policy Analyst, January 1998–January 1999

United States Senate, Committee on Energy and Natural Resources

Democratic Staff Director, 1999–2001, 2003–2007

Staff Director, 2001–2003, 2007–2012

Senior Policy Advisor, January 2013

Staff [S.Res.9], January 2013–March 2013

U.S. Department of Energy, Office of the Under Secretary for Science

Expert (temporary appointment as a Special Government Employee), March 2013–April 2013

U.S. Department of Energy, Office of Science

Senior Advisor, April 2013–June 2013

Executive Office of the President, Office of Science and Technology Policy

Consultant, June 2013 to present

9. Attach a copy of your resume. A copy is attached.

10. List any advisory, consultative, honorary, or other part-time service or positions with Federal, State, or local governments, other than those listed above, within the last five years: None.

11. List all positions held as an officer, director, trustee, partner, proprietor, agent, representative, or consultant of any corporation, company, firm, partnership, or other business, enterprise, educational, or other institution within the last five years.

Member, Nominating Committee, Section on Societal Impacts of Science and Engineering, American Association for the Advancement of Science, February 2009–February 2012.

12. Please list each membership you have had during the past ten years or currently hold with any civic, social, charitable, educational, political, professional, fraternal, benevolent or religious organization, private club, or other membership orga-

nization. Include dates of membership and any positions you have held with any organization. Please note whether any such club or organization restricts membership on the basis of sex, race, color, religion, national origin, age, or handicap.

American Association for the Advancement of Science (member, 1979 to present)

American Chemical Society (member, 1976 to present)

Sigma Xi—The Scientific Research Society (member, 1981 to present)

St. Camillus Roman Catholic Parish, Silver Spring, Maryland (member, 2001 to present)

American Association of Retired Persons (member, 2011 to present)

Environment Maryland (periodic membership over last 10 years)

Kiva (member, 2008 to present)

MIT Club of Washington (periodic membership over last 10 years)

Obama for America Energy and Environment Team (member, 2012 to present)

Organizing for America (member, 2013 to present)

None of the above organizations restricts membership on the basis of the above factors, except that full membership in St. Camillus Parish requires one to be a Roman Catholic.

13. Have you ever been a candidate for and/or held a public office (elected, non elected, or appointed)? If so, indicate whether any campaign has any outstanding debt, the amount, and whether you are personally liable for that debt: No.

14. Itemize all political contributions to any individual, campaign organization, political party, political action committee, or similar entity of $500 or more for the past ten years. Also list all offices you have held with, and services rendered to, a state or national political party or election committee during the same period.

Obama for America Energy and Environment Team (member, 2012 to present) My services consisted solely of attending a public meeting of the Energy and Environment Team and receiving its newsletters and e-mails.

15. List all scholarships, fellowships, honorary degrees, honorary society memberships, military medals, and any other special recognition for outstanding service or achievements.

Certificate of Honor for scholarly accomplishment in the sciences, Ursinus College, November 1985.

Cash performance award for staff contribution to conference on "What Research Strategies Best Serve the National Interest in a Period of Budgetary Stress," National Research Council, 1986.

Career Appointment to the Senior Executive Service, 1990.

DOE Senior Executive Service Superior Performance Award (Highest Bonus Award), 1991, 1992.

DOE Senior Executive Service Performance Award and cash bonus for exceptional performance rating, 1993.

DOE Senior Executive Service highest performance rating, 1994, 1995, 1996, 1997.

John C. Stennis Congressional Staff Fellow for the 106th Congress, Stennis Center for Public Service, 1999–2000.

Stennis Center for Public Service, Senior Congressional Staff Fellow, 2001–2012.

Named one of "The Hill 100" key staffers of the 109th Congress by National Journal, (April 9, 2005 issue).

Salute to Excellence award from the President of the American Chemical Society, ACS Middle Atlantic Regional Meeting, May 17, 2007.

Public Service Award, Energy Efficiency Forum North America, 2012 (*http://www.eeforum.net/Awards/Energy-Leadership-Awards*).

Recognition Award for Service to the Industry, National Energy Resources Organization, 2012.

Committee on Energy and Natural Resources Resolution of Commendation for Service, 2012.

16. Please list each book, article, column, or publication you have authored, individually or with others. Also list any speeches that you have given on topics rel-

evant to the position for which you have been nominated. Do not attach copies of these publications unless otherwise instructed.

I have done my best to identify all books, articles, columns or publications, including through a review of my personal files and searches of publicly available electronic databases. Despite my searches, there may be additional presentations that I have been unable to identify, find or remember. I have located the following:

Books

Frontiers in the Chemical Sciences, Washington, D.C.: AAAS Press, 1986, 600 pp. (Co-editor with William Spindel)

National Research Council Reports (Available from *www.nap.edu*)

(While reports from the National Research Council reflect the views of the expert committees that produce them, as the responsible member of the Research Council staff for the below reports, I also had a substantial role in writing and editing them.)

Biosafety in the Laboratory: Prudent Practices for Handling and Disposal of Infectious Materials (1989)

Chemical Processes and Products in Severe Nuclear Reactor Accidents (1989)

Frontiers in Chemical Engineering: Research Needs and Opportunities (1988)

Separation and Purification: Critical Needs and Oppo1iunities (1987)

Report of the Research Briefing Panel on Chemical Processing of Materials and Devices for Information Storage and Handling (1987)

Future Directions in Advanced Exploratory Research Related to Oil, Gas, Shale, and Tar Sand Resources (1987)

Report of the Research Briefing Panel on Chemical and Process Engineering for Biotechnology (1984)

Articles

Robert M. Simon, "Issues in Risk Assessment and Cost-Benefit Analysis and Their Relationship to Regulatory Reform," University of Cincinnati Law Review, 1995, 63(4), pp. 1611–1641.

Jeff Bingaman, Robert M. Simon, and Adam Rosenberg, "Needed: A Revitalized National S&T Policy," Issues in Science and Technology Policy, Spring 2004, pp. 21–24. <*http://www.issues.org/20.3/p__bingaman.html*>

Robert M. Simon, "Seven Rules for Wannabe Cabinet Members," *Washington Post,* November 16, 2012, p. B3. <*http://miicles.washingtonpost.com/2012-11-16/opinions/35503240_1_nuclear-waste-nuclear-problems-energy-development*>.

Robe1i M. Simon, "Staff Empowe1ment Is Key to Manager Success," POLITICO, March 14, 2013, pp. 19–20. <*http://www.politico.com/story/2013/03/staff-empowerment-is-key-to managers-success-88882.html*>.

Speeches, Talks, and Panel Discussions

	2002
April 26	American Institute of Chemical Engineers, Northern California Section 40th Annual Symposium: "Meeting the Energy Needs of the New Millenium" Speaker Topic: An energy policy for the future
	2003
January 28	National War College Course on Energy and Environn1ental Policy (Spring Semester) Washington, D.C. Speaker Topic: Congress and national energy and climate policies
October 8	National War College Course on Energy and Environmental Policy (Fall Semester) Washington, D.C. Speaker Topic: Congress and national energy and climate policies

November 21	Georgetown University Law Center Sustainable Energy Institute Forum “Democratic Presidential Candidates—Views on Energy Policy” Moderator
	2005
February 2	National War College Course on Energy and Environmental Policy Washington, D.C. Speaker Topic: Congress and national energy and climate policies
February 8	Pew Center on Climate Washington, D.C. Panel participant Topic: National energy and climate policies
November 15	American Association for the Advancement of Science Leadership Seminar Washington, D.C. Speaker Topic: Congress and national energy and climate policies
December 1	Center for the New West Annual Energy Roundtable Sun Valley, ID Speaker Topic: National energy policy
	2006
February 1	National War College Course on Energy and Environmental Policy Washington, D.C. Speaker Topic: Congress and national energy and climate policies
February 22	Coal Utilization Research Council Washington, D.C. Speaker Topic: Energy and climate change policy
April 21	American Gas Association Washington, D.C. Speaker Topic: Energy and climate change policy
October 16	American Public Power Association Washington, D.C. Speaker Topic: Energy and climate change policy
October 24	Keystone Energy Forum Annual Meeting Keystone, CO Speaker Topic: Energy and climate change policy
November 30	Center for the New West Annual Energy Roundtable Sun Valley, ID Speaker Topic: National energy policy
December 12	Eleanor Roosevelt High School AP Government Classes Greenbelt, MD Speaker Topic: The roles of Congressional committees and staff
	2007
January 31	National War College Course on Energy and Environmental Policy Washington, D.C. Speaker Topic: Congress and national energy and climate policies
September 27	American Association of Blacks in Energy Washington, D.C. Speaker Topic: National energy policy
November 13	American Association for the Advancement of Science Leadership Seminar Washington, D.C. Speaker Topic: Congress and national energy and climate policies

November 19	National Research Council Committee on Science, Technology, and the Law Washington, D.C. Speaker Topic: National energy policy

2008

January 14	Eleanor Roosevelt High School AP Government Classes Greenbelt, MD Speaker Topic: The roles of Congressional committees and staff
February 19	National War College Course on Energy and Environmental Policy Washington, D.C. Speaker Topic: Congress and national energy and climate policies
June 17	Resources for the Future Workshop on Climate Change Policy Washington, D.C. Speaker Topic: Energy policy and climate change
October 29	National War College Course on Energy and Environmental Policy Washington, D.C. Speaker Topic: Congress and national energy and climate policies
November 14	North Dakota Energy Conference Bismarck, ND Speaker Topic: Recap of energy policy and legislation in 110th Congress

2009

February 9	Women's Council on Energy and the Environment Monthly Breakfast Washington, D.C. Speaker Topic: Outlook for new Congress
February 19	60th Annual Oil and Gas Law Conference Houston, TX Speaker Topic: Outlook for energy legislation/regulation in new Administration
March 9	Midwestern Conference of Major Superiors of Roman Catholic Orders of Religious Men Belleville, IL Speaker Topic: Climate and energy policies
June 18	Howard Baker, Jr., Center for Public Policy and Woodrow Wilson International Center Panel on Policy Responses to Climate Change Washington, D.C. Panel participant Topic: Congressional views on climate change and energy
June 24	CQ Forum on Climate Change and Manufacturing Washington, D.C. Panel participant Topic: Congressional views on climate change and energy
July 28	Covington and Burling Breakfast Forum Washington, D.C. Speaker Topic: Update on Senate Energy and Natural Resources Committee
September 14	American Geological Institute Leadership Forum Washington, D.C. Panel participant Topic: Congressional views on climate change and energy
October 5	CERA Natural Gas Workshop Washington, D.C. Panel participant Topic: Policy landscape for natural gas as seen from Congress
October 16	Elmhurst College Niebuhr Center Social Justice Program Elmhurst, IL Speaker Topic: Climate and energy policies

October 20	CQ Roll Call Group Climate Conference Washington, D.C. Panel participant Topic: Upcoming UN Copenhagen meeting and climate/energy policies
November 17	American Association for the Advancement of Science Leadership Seminar Washington, D.C. Speaker Topic: Congress and national energy and climate policies
November 19	Catholic University Young Democrats Club Washington, D.C. Speaker Topic: Energy and climate policy
2010	
January 26	American Gas Association Monthly Legislative Breakfast Washington, D.C. Speaker Topic: Current status of energy and climate legislation
February 20	American Association for the Advancement of Science Annual Meeting San Diego, CA Panel participant Topic: Science, technology, and Congress
March 10	CSIS Energy Policy Conference: The Unconventional Gas Revolution Washington, D.C. Speaker Topic: Potential perspectives on unconventional natural gas
March 11	CQ—Roll Call Group Forum on Natural Gas Washington, D.C. Panel participant Topic: Congressional perspective on unconventional natural gas
March 18	Standard and Poor's Annual Utility Conference New York, NY Speaker Topic: Path forward on energy and climate policy
April 16	American Exploration and Production Council Annual Business Meeting Washington, D.C. Speaker Topic: Current status of energy legislation
April 27	Podesta Group "At the Table" Series Washington, D.C. Speaker Topic: Current status of energy legislation
May 18	Brookings Institution Forum: "Back to the Future: The Prospects for Energy and Climate in 2010" Washington, D.C. Panel participant Topic: Science, policy, and regulation
September 29	National Journal Energy Panel Washington, D.C. Panel participant Topic: Status of energy legislation
November 4	CQ Post-Election Conference Washington, D.C. Panel participant Topic: Outlook for energy policy in the next Congress
November 10	National Research Council Governing Board Washington, D.C. Speaker Topic: How the Research Council can help Congress on important issues, including energy
November 16	American Association for the Advancement of Science Leadership Seminar Washington, D.C. Speaker Topic: Congress and national energy and climate policies
November 29	President's Council of Advisors on Science and Technology Release of Report on Energy Technology Innovation System Washington, D.C. Panel discussant Topic: Congressional perspective on report recommendations

December 8	National War College Course on Energy and Environmental Policy Washington, D.C. Speaker Topic: Congress and national energy and climate policies

2011

January 20	Eleanor Roosevelt High School AP Government Classes Greenbelt, MD Speaker Topic: The roles of Congressional committees and staff
February 11	Department of Commerce Manufacturing Council Energy Subcommittee Washington, D.C. Panel participant Topic: Energy and manufacturing policy
February 20	American Association for the Advancement of Science Annual Meeting Washington, D.C. Panel participant Topic: Science, technology, and Congress
February 24	Pew Center for Global Climate Change/Georgetown Climate Center Conference on State and Federal Climate and Energy Policy Washington, D.C. Participant on “Federal Outlook” Panel Topic: Outlook for energy policy in the 112th Congress
March 1	Abraham Group/Bloomberg Conference on Energy and Environmental Challenges Washington, D.C. Panel participant Topic: Outlook for energy legislation in 112th Congress
March 11	25x25 Meeting Washington, D.C. Speaker Topic: Renewable fuels policy
May 20	Quinn Gillespie Energy Breakfast Washington, D.C. Joint Presentation with McKie Campbell (Republican Staff Director) Topic: Update on Senate Committee on Energy and Natural Resources
June 15	DOE National Laboratories “Strategic Planning Community of Practice” Arlington, VA Speaker Topic: Update on Senate Committee on Energy and Natural Resources
September 14	Superconducting Particle Accelerator Forum of America Washington, D.C. Speaker Topic: Outlook for energy R&D budgets
October 10	U.S. Association for Energy Economics/ International Association for Energy Economics 30th North American Conference Panel Participant Topic: Changing U.S. and international energy policy perspectives
October 19	UNEP Finance Initiative Global Roundtable 2011 Washington, D.C. Panel Participant Topic: “Green” energy future seen from different perspectives
November 2	National War College Course on Energy and Environmental Policy Washington, D.C. Speaker Topic: Congress and national energy and climate policies
November 15	Natural Resources Defense Council E2 Entrepreneurs Group Washington, D.C. Speaker Topic: Outlook for energy and climate policies
November 16	Atlantic Magazine Event on Energy Policy Washington, D.C. Joint Presentation with McKie Campbell (Republican Staff Director) Topic: Update on Senate Committee on Energy and Natural Resources

November 17	American Association for the Advancement of Science Leadership Seminar Washington, D.C. Speaker Topic: Congress and national energy and climate policies

2012

February 14	American Council of Engineering Companies Energy and Environment Committee Winter Meeting Washington, D.C. Speaker Topic: Clean Energy Standard and electricity policy
March 5	CERAWeek 2012 Houston, TX Panel on "U.S. Energy Policy in an Election Year" Panel participant Topic: Congressional outlook on energy policy
April 25	American Fuel and Petrochemical Manufacturers Meeting Washington, D.C. Speaker Topic: Congressional perspective on energy policy
May 10	National Research Council Board on Environmental Change and Society Washington, D.C. Reception speaker Topic: Opportunities for Board to contribute to energy policy
May 21	Woodrow Wilson International Center for Scholars: Panel on "Congress and the Global Energy Crunch" Washington, D.C. Panel participant Topic: Congressional perspective on energy policy
May 23	Geothermal Energy Association Washington, D.C. Speaker Topic: Renewable energy policy
June 7	Argus Renewables Conference Washington, D.C. Speaker Topic: Renewable energy policy
June 20	Superconducting Particle Accelerator Forum of America Washington, D.C. Speaker Topic: Outlook for energy R&D budgets
June 29	Silicon Valley Energy Summit Stanford, CA Speaker Topic: Energy policy from a Federal legislative perspective
July 11	Association of American Universities SRO–CFR Joint Meeting Washington, D.C. Speaker Topic: Energy Policy from a Federal legislative perspective
September 27	Lockheed Martin Energy Forum Crystal City, VA Panel participant Topic: Outlook for energy policy
October 12	Energy and Environmental Study Institute Congressional Briefing on China Washington, D.C. Panel participant Topic: Energy policy and China
October 15	Stanford University Course, "Energy in Transition: Technology, Policy and Politics" (Energy 154) Stanford, CA Speaker Topic: Energy markets and energy policies
November 9	World Resources Institute Corporate Consultative Group Meeting 2012 Mindshare Meeting Washington, D.C. Panel participant Topic: Outlook for action on climate change

December 11	Bureau on Safety and Environmental Enforcement (BSEE) Staff Retreat Department of the Interior Building Washington, D.C. Speaker Topic: Congressional perspective on BSEE mission
	2013
February 12	American Association for the Advancement of Science (AAAS) AAAS Fellows Monthly Meeting Washington, D.C. Speaker Topic: Introduction to energy and climate policy
February 14	American Chemical Society Webinar on Federal Budget for ACS Board Members Washington, D.C. Panel participant Topic: Congressional outlook for budget
April 10	George Washington University School of Law 2013 J.B. and Maurice C. Shapiro Conference Laying the Foundation for a Sustainable Energy Future: Legal and Policy Challenges Washington, D.C. Panel Moderator Topic: Economic sustainability in energy policy

17. Please identify each instance in which you have testified orally or in writing before Congress in a governmental or non-governmental capacity and specify the date and subject matter of each testimony.

In my capacity as Principal Deputy Director of the Office of Energy Research, U.S. Department of Energy, I testified on behalf of the Administration at a hearing entitled "The Status of the Superconducting Super Collider," before the Subcommittee on Investigations and Oversight of the Committee on Science, Space, and Technology, U.S. House of Representatives, April 9, 1992. The Superconducting Super Collider was a major project under construction by the Department of Energy. My testimony described the then-current status of the project.

18. Given the current mission, major programs, and major operational objectives of the department/agency to which you have been nominated, what in your background or employment experience do you believe affirmatively qualifies you for appointment to the position for which you have been nominated, and why do you wish to serve in that position?

The Office of Science and Technology Policy (OSTP) was established to serve as a source of scientific and technological analysis and judgment for the President with respect to major policies, plans, and programs of the Federal Government. Some of the most important and complex issues facing the Nation at this time are in the areas of environment and energy. In these areas, there is a great need for careful and balanced consideration of scientific and technical information, including the unce1iainties in such information, as it contributes to the broader analysis of the relevant issues.

OSTP is not the final word in the formulation of any specific policy. It must work cooperatively with other parts of the Executive Office of the President, Federal Departments and agencies, and Congress as these other organizations bring their expertise to their particular roles in the policy development process. OSTP, though, must be a key contributor in its sphere of competence.

If confirmed, I believe that my career to date has given me an excellent background from which to make a contribution to OSTP as its Associate Director for Environment and Energy.

My scientific training is in chemistry, a core scientific discipline for environmental and energy issues. My early career experiences in Washington were at the National Research Council of the National Academies of Sciences and Engineering, where I directed the process of developing technical consensus around science, engineering, and energy policy issues.

When I went to the Department of Energy in 1989, I had the good fortune to work directly for the Secretary of Energy, Admiral James D. Watkins. In that capacity, I was responsible for drawing together and presenting relevant scientific and technical info1mation and advice to him. I was also able to see how that information was used in the formulation and execution of energy and environmental policy. After successfully establishing the Secretary of Energy Advisory Board and directing its first set of studies, I was promoted into a more responsible position in the senior line management of the Office of Energy Research. There I learned more about scientific program management and the organizational and budgetary challenges that must be met in order to successfully manage programs and projects.

In June 1993, the Chairman of the Senate Energy and Natural Resources Committee, Sen. J. Bennett Johnston, requested that I be detailed to the Committee as a science expert. As a member of the Committee's staff, I saw how scientific and technical information affects and is sometimes embodied in energy and environmental legislation.

After Sen. Johnston's retirement, I was assigned by the Department of Energy to help Sen. Jeff Bingaman as a scientific and technical advisor. After a year, he hired me as a member of the staff of the Joint Economic Committee in 1998 and then asked me to lead the Democratic staff of the Senate Energy and Natural Resources Committee in 1999. My 14 years heading the staff of the Committee, about half of which was spent in the majority and half in the minority, gave me a very strong understanding of how public policy in energy and environmental areas can be successfully crafted through legislation. I built and managed a very capable staff of experts in the disciplines required to develop such legislation. As one of the most substantive, constructive, and bipartisan members of the Senate, Sen. Bingaman also set a high standard of excellence in working with his colleagues on both sides of the aisle, which I tried to emulate.

I believe that all of these experiences, and the accomplishments that I was able to contribute to over the course of my career in the Senate, affirmatively qualifies me for a position that is entrusted with the development and reasoned application of scientific and technical information to the public policy process at its highest level in the Executive Branch.

My interest in the position of Associate Director for Environment and Energy at the OSTP is natural, given my background and experience. My career has been marked by a commitment to public service. I have a strong desire to help formulate sensible approaches to crucial national and international challenges in the area of energy and the environment. U.S. energy policy is at a crossroads where many previous assumptions about our energy future must be re-examined. Domestic resources of natural gas, thanks to technological breakthroughs, now far exceed previous estimates that led to projected energy futures in which gas would become expensive and constrained. At the same time, the environmental challenges posed by an energy policy course that greatly increases atmospheric concentrations of greenhouse gases must be addressed. While the prospect of addressing these complex environmental and energy challenges in a manner that develops long-term social and political consensus is daunting, I cannot think of a more important set of issues to which I could make a substantive contribution, if confirmed.

19. What do you believe are your responsibilities, if confirmed, to ensure that the department/agency has proper management and accounting controls, and what experience do you have in managing a large organization?

I take very seriously my responsibility as a manager for ensuring that the activities under my purview are conducted in a manner that fully complies with applicable management and accounting controls. In OSTP, a number of personnel with specific responsibility for management and accounting issues report to the Director through his Chief of Staff. If confirmed, I plan to work closely with these colleagues to make sure that proposed expenditures under my purview are compatible with the missions and authorized programs of the Office; that I am complying with appropriate internal controls to prevent waste, fraud, and abuse, and cooperating with compliance audits; and that any concerns about potential management problems are promptly shared with the persons responsible for addressing those concerns.

Over the course of my career, I have managed organizations large and small.

While at the National Research Council (1982–1989), I progressed through a series of positions of increasing management responsibility, culminating in a dual position as Staff Director of the Board on Chemical Sciences and Technology and an acting position one level up as the Associate Executive Director of the largest management unit of the Research Council at that time.

This track record of managerial experience was sufficient to qualify me for a career appointment in the Senior Executive Service in 1990 (which required a review of my managerial competencies both by an internal board in the Department and at the Office of Personnel Management), when I became a permanent full-time employee of the Department of Energy.

As the first Executive Director of the Secretary of Energy Advisory Board (1990–1991), I was responsible for establishing a new office, hiring its staff, and creating procedures to ensure compliance with the applicable Departmental orders and regulations.

As Principal Deputy Director of the Office of Energy Research (1991–1993), I was the senior career civil servant in an organization with several layers of management and over 1,100 Federal employees across the country. I was responsible for both general management direction and overall compliance with requirements that included administrative and personnel procedures, as well as environment, safety and health requirements. While in this position, I participated in a revamp and streamlining of the grant-making procedures and requirements of the Office.

As Democratic Staff Director and full committee Staff Director of the Senate Committee on Energy and Natural Resources (1999–2012), I supervised over 30 professional and support staff consisting of very highly skilled and specialized lawyers, scientists, engineers, and economists. During my tenure, the Committee was one of the most productive in the Senate, enacting 426 public laws from 1999–2012. Two of these laws were major bills that set new directions for national energy policy. Two of the other 424 public laws amalgamated an additional 221 individual public lands bills between them, and represented a major accomplishment in the protection of our natural resources. Successfully passing these laws required strong staff management, close coordination with Senate leadership, and careful consultation on a bipartisan and bicameral basis with colleagues who sometimes had views that diverged from my own. Chairman Bingaman set the tone for substantive, constructive, and bipartisan engagement on these issues, and I was fortunate to be able to work for him in that vein.

I have received consistently favorable reviews for my management style and the results it has achieved over the years, including the highest performance rating for each year I was at the Department of Energy and substantial cash performance awards in 3 of those years.

20. What do you believe to be the top three challenges facing the department/agency, and why?

The top challenge facing OSTP in the environment and energy arena is ensuring that a careful and balanced consideration of scientific and technical information is at the foundation of the public policy process for issues where such information materially affects the decision to be made. There are many such issues at the nexus between energy and environmental concerns. In order to create a setting where innovation and investment in long-term solutions to these concerns can flourish, we need a broadly-based and stable consensus on the path forward. Conducting scientific observations that lead to generally accepted and predictive models of natural systems; assembling credible information on the extent, economic availability, and risks/benefits of accessing needed natural resources; and developing technical analyses of relevant future technologies and policies are all necessary if we are to identify a path forward toward solutions that are both environmentally and economically sustainable.

Closely behind this challenge in terms of difficulty and complexity is the need for OSTP to help the Administration, the Congress, and key elements of American society (such as our industrial sector and our institutions of education and training) to address the most important S&T needs and opportunities at a time of severely constrained Federal resources. This is because we must continue to develop the scientific information and technological advances required to meet important national needs, but do not have infinite resources to do so. OSTP must establish a broad and coherent set of priorities for science and technology investments. These priorities must be determined in a way that maintains excellence in the most important areas of science and engineering, that allows for new initiatives to address outstanding intellectual prospects and crucial societal needs, that ensures that we have the highly trained personnel needed to exploit future frontier areas of research and development, and that guides the difficult task of identifying and phasing down investments in areas of lesser importance.

The third significant challenge OSTP faces is a function of its institutional design. OSTP has a broad mandate to advise the President, but no line authority over the Federal agencies and organizations about which it is advising. Thus, to be successful, it must build effective relationships of persuasion and trust across a spectrum of Federal and external entities. These relationships are required to gain the information and analysis needed to develop the substance of good advice, but likely will develop only if OSTP's processes allow the affected agencies to feel that their voices are heard in an effective and timely manner. The effectiveness of OSTP in convening disparate agencies, coordinating their information in the policy development process, and implementing the decisions that result from its advice will always be a product of both the quality of its staff and the confidence it has engendered in the fairness of its processes. And, OSTP will always be challenged by the necessity of carrying out its work in limited time.

B. POTENTIAL CONFLICTS OF INTEREST

1. Describe all financial arrangements, deferred compensation agreements, and other continuing dealings with business associates, clients, or customers. Please include information related to retirement accounts.

I have no financial arrangements, deferred compensation agreements, or other continuing dealings with any business associates, clients, or customers. I will continue to maintain my TIAA traditional retirement annuity (fixed), which had a value, as of March 31, 2013, of $121,056.52. I also have a retirement account with the Federal Thrift Savings Plan (TSP), which had a value, as of July 31, 2013, of $827,981.81.

2. Do you have any commitments or agreements, formal or informal, to maintain employment, affiliation, or practice with any business, association or other organization during your appointment? If so, please explain. No.

3. Indicate any investments, obligations, liabilities, or other relationships which could involve potential conflicts of interest in the position to which you have been nominated.

In connection with the nomination process, I have consulted with the Office of Government Ethics and OSTP's designated agency ethics official to identify potential conflicts of interest. Any potential conflicts of interest will be resolved in accordance with the terms of an ethics agreement that I have entered into with OSTP's designated agency ethics official and that has been provided to this Committee. I am not aware of any other potential conflicts of interest.

4. Describe any business relationship, dealing, or financial transaction which you have had during the last ten years, whether for yourself, on behalf of a client, or acting as an agent, that could in any way constitute or result in a possible conflict of interest in the position to which you have been nominated.

In connection with the nomination process, I have consulted with the Office of Government Ethics and OSTP's designated agency ethics official to identify potential conflicts of interest. Any potential conflicts of interest will be resolved in accordance with the terms of an ethics agreement that I have entered into with OSTP's designated agency ethics official and that has been provided to this Committee. I am not aware of any other potential conflicts of interest.

5. Describe any activity during the past ten years in which you have been engaged for the purpose of directly or indirectly influencing the passage, defeat, or modification of any legislation or affecting the administration and execution of law or public policy.

No activities outside my duties as an employee of the United States Senate.

6. Explain how you will resolve any potential conflict of interest, including any that may be disclosed by your responses to the above items.

In connection with the nomination process, I have consulted with the Office of Government Ethics and OSTP's designated agency ethics official to identify potential conflicts of interest. Any potential conflicts of interest will be resolved in accordance with the terms of an ethics agreement that I have entered into with OSTP's designated agency ethics official and that has been provided to this Committee. I am not aware of any other potential conflicts of interest.

C. LEGAL MATTERS

1. Have you ever been disciplined or cited for a breach of ethics by, or been the subject of a complaint to any court, administrative agency, professional association, disciplinary committee, or other professional group? If so, please explain. No.

2. Have you ever been investigated, arrested, charged, or held by any Federal, State, or other law enforcement authority of any Federal, State, county, or municipal entity, other than for a minor traffic offense? If so, please explain. No.

3. Have you or any business of which you are or were an officer ever been involved as a party in an administrative agency proceeding or civil litigation? If so, please explain. No.

4. Have you ever been convicted (including pleas of guilty or nolo contendere) of any criminal violation other than a minor traffic offense? If so, please explain. No.

5. Have you ever been accused, formally or informally, of sexual harassment or discrimination on the basis of sex, race, religion, or any other basis? If so, please explain. No.

6. Please advise the Committee of any additional information, favorable or unfavorable, which you feel should be disclosed in connection with your nomination. None to my knowledge.

D. RELATIONSHIP WITH COMMITTEE

1. Will you ensure that your department/agency complies with deadlines for information set by congressional committees? Yes.

2. Will you ensure that your department/agency does whatever it can to protect congressional witnesses and whistle blowers from reprisal for their testimony and disclosures? Yes.

3. Will you cooperate in providing the Committee with requested witnesses, including technical experts and career employees, with firsthand knowledge of matters of interest to the Committee? Yes.

4. Are you willing to appear and testify before any duly constituted committee of the Congress on such occasions as you may be reasonably requested to do so? Yes.

RESUMÉ OF ROBERT M. SIMON

Experience

Executive Office of the President, Office of Science and Technology Policy
Consultant, June 2013 to present

Provide advice on policy formulation to the Director and other staff of the Office of Science and Technology Policy.

U.S. Department of Energy
Expert, Office of the Under Secretary for Science, March 2013–April 2013
Senior Advisor, Office of Science, April 2013–June 2013

Provided advice on policy formulation and outreach to the Office of Science and other elements of the Department of Energy.

United States Senate, Committee on Energy and Natural Resources
Staff *Director,* 2001–2003, 2007–2012
Democratic Staff Director, 1999–2001, 2003–2007
Senior Policy Advisor, January 2013
Staff [S. Res. 9], January 2013–March 2013

Roles

- Served as overall Staff Director for the Committee when Democrats were the Majority party in the Senate. Responsible for overall coordination and administrative management of the Committee, including the nonpartisan support staff. Developed and implemented an effective bipartisan agenda of legislative and oversight activities over several successive Congresses.
- Served as Democratic Staff Director when Democrats were the Minority party. Responsible principally for Democratic staff. Responded to Majority initiatives and worked to shape bipartisan outcomes.
- In both roles, directed professional and support staff for the Committee. Formulated legislative strategies and negotiated agreements with Republican staff. Dealt directly with senior government policymakers, including the Secretary of Energy, the Secretary of the Interior, the White House, and the Senate Democratic leadership.

Accomplishments

- In 112th Congress (2011–2012), continued to work towards bipartisan formulation of energy policy, winning Committee approval of 19 energy bills. These bills promoted clean energy development, encouraged advanced vehicles, improved energy efficiency standards, conserved water in energy applications, ensured the cybersecurity of the national electrical grid, and secured future availability of key isotopes for medical diagnosis. Two of these bipartisan bills were enacted into law.
- From the 106th to the 112th Congress (1999–2012):
    - ○ Supervised Committee approval of 955 bills and resolutions.
    - ○ Contributed to the enactment of 426 public laws.
    - ○ Managed Committee's review for the Senate confirmation of 128 Executive Branch nominations.

Notable Laws

- Omnibus Public Land Management Act of 2009. Combined 160 separate measures approved by the Committee during the 110th Congress into a law enacted at the beginning of the 111th Congress. Protected over 2 million acres of wilderness, expanded several national parks, established 10 new National Heritage Areas, ensured the wild and scenic character of hundreds of miles of rivers, and authorized numerous water projects at the U.S. Bureau of Reclamation.

- Consolidated Natural Resources Act of 2008. Consolidated enactment of 62 separate legislative measures to conserve and protect public lands.
- Energy Independence and Security Act of 2007. Provided a substantial boost to the use of renewable fuels and a major increase in energy efficiency standards, including the first increase in vehicle fuel economy standards in 30 years. Made key advances towards effective carbon capture and sequestration technologies. Enacting this law required detailed coordination with leadership staff in the House of Representatives to harness the work of 5 Senate committees and 10 House committees on this legislation, a task that had to be accomplished in an informal process of unprecedented complexity between the two chambers.
- America COMPETES Act. The first comprehensive science and technology competitiveness law in over a decade. Boosted basic research across the government and education and training of scientists and engineers.
- Energy Policy Act of 2005. The first comprehensive law governing energy policy in 13 years. Boosted the scientific and technological missions and programs of the Department of Energy (DOE), including the first comprehensive authorization of DOE research and development (R&D) programs since the 1970s and the establishment of a new Under Secretary for Science to bring greater coherence to DOE's R&D efforts. Established strong new consumer protections for electricity markets and robust fiscal incentives for renewable energy and energy efficiency.
- Energy Employees Occupational Illness Compensation Act of 2000. Established a new program to compensate DOE workers for illnesses from past hazardous and radiological exposures in the workplace. Since enactment, over $8 billion of compensation and health care costs have been paid to over 125,000 sick workers and their survivors.

Congress of the United States, Joint Economic Committee
Policy Analyst, 1998–1999

Chief scientific and technical advisor to the Democratic staff of the Joint Economic Committee. Responsible for cross-cutting issues involving the interaction between the economy and defense, energy, and environmental sectors, as well as the role of Federal R&D in promoting national economic productivity.

- Led a successful effort in which Congress directed the Department of Defense (DOD) to double its commitment to basic and applied R&D over an 10-year period. This effort made the training of the next generation of scientists and engineers for future defense needs a key objective of the DOD R&D program.
- Broadened the statutory authority for DOE laboratories to carry out R&D work for other agencies and clarified and reduced administrative charges to these other agencies.

United States Senate, Office of Senator Jeff Bingaman (D–New Mexico)
(On detail from the U.S. Department of Energy)
Science and Technology Advisor, 1997–1998

Chief scientific and technical expert for Senator Jeff Bingaman, with lead responsibility for scientific and technical issues relating to energy, defense, environment, and management of Federal R&D.

- Improved DOE management of procurement, R&D, and facilities through the Department of Energy Standardization Act of 1997 and amendments to the National Defense Authorization Act for FY 1998.
- Primary drafter of amendments to appropriations bills preserving Federal-utility energy conservation programs, re-establishing a scientific and technical advisory capability for Congress similar to the former Office of Technology Assessment, and stopping sales from the Nation's Strategic Petroleum Reserve.

United States Senate, Committee on Energy and Natural Resources
(On detail from the U.S. Department of Energy)
Science Fellow, 1993–1997

Scientific and technical advisor to senior Senate leaders in the energy and environmental arena. Worked principally with Committee chairman, Senator J. Bennett Johnston (D—Louisiana).

- Made Federal-industry partnering more predictable through changes to technology transfer laws.
- Wrote laws eliminating restrictions affecting the hiring of senior managers in the DOE and enhancing the ability of academic researchers to serve as temporary Arotators@ managing DOE R&D programs.
- Key expert on environmental and health risk assessment and administrative law during the Senate debate on regulatory reform.

U.S. Department of Energy, Office of Energy Research
Principal Deputy Director, 1991–1993

Principal line officer under the Director of Energy Research, Dr. Will Happer, who managed an annual R&D budget of over $3 billion and over 1,100 staff in Washington, D.C. and in regional field offices.

- Provided day-to-day management oversight over R&D programs in materials, chemistry, engineering, geosciences, environmental sciences, molecular biology, nuclear medicine, biotechnology, and global climate change. Helped reorient the R&D priorities of the Office, resulting in increased budgets while other DOE programs were cut.
- Changed DOE procurement regulations to cut paperwork requirements for R&D funding by two-thirds.
- Senior line manager supervising management of environment, worker safety, and health at DOE facilities.
- Testified before Congress, led a multi-agency U.S. delegation to a major workshop with the Japanese on environmental technologies, and routinely worked with senior Congressional and Executive Branch staff on R&D matters.

U.S. Department of Energy, Office of the Secretary of Energy Advisory Board
Executive Director, 1990–1992
Expert, 1989–1990

Developed and directed the Secretary of Energy Advisory Board, a group of distinguished external advisors who reported directly to the Secretary of Energy, Admiral James D. Watkins, and served as the Department's long-range planning arm. Helped recruit and worked closely with first Chair, Dr. Thomas Everhart (then-President of the California Institute of Technology).

- Organized high-profile studies on national energy policy; the future of DOE national laboratories; economic modeling; radioactive waste management; and science education policy.
- Served as principal liaison between the Secretary of Energy and the scientific and technical community.
- Coordinated DOE participation in Administration science and technology policy making.

National Research Council, Washington, D.C., 1982–1989

A progression of assignments involving greater amounts of responsibility at the Research Council (the operating arm of the National Academy of Sciences and the National Academy of Engineering), leading to two final concurrent positions: one of which involved directing a staff of 5 professional and support personnel, and a portfolio of projects with a combined annual budget of over $650,000; and the other of which involved managing the largest unit of the Research Council.

- Produced 7 significant reports from 1984–1989.
- Managed external peer review for a $40 million/year Air Force research program in chemical and atmospheric sciences.
- Coordinated U.S. participation in 3 international scientific organizations.

Education

Massachusetts Institute of Technology, Cambridge, Massachusetts—Ph.D., Inorganic Chemistry, June 1982

Ursinus College, Collegeville, Pennsylvania—B.S., Chemistry, May 1977

Selected Recognitions

Elected a Fellow of the American Association for the Advancement of Science, 2006.

Career Appointment to the Senior Executive Service, 1990 (one of the youngest career Senior Executives in the DOE).

Leadership award from the President of the American Chemical Society, ACS Middle Atlantic Regional Meeting, May 2007.

2008 Alumni Award, Ursinus College.

Public Service Award, Energy Efficiency Forum North America, 2012

Recognition Award for Service to the Industry, National Energy Resources Organization, 2012

Senator NELSON. Thank you, Dr. Simon. Let me turn to Senator Thune for his statement, please. Senator.

STATEMENT OF HON. JOHN THUNE, U.S. SENATOR FROM SOUTH DAKOTA

Senator THUNE. Thank you, Mr. Chairman. I want to thank you for holding this hearing to consider these nominations today. And I want to thank our panelists here today for their willingness to serve. Obviously, already hearing from Dr. Simon, and I look forward to hearing from the other members of the panel as well, but I want to thank them for being here and for their willingness to take on these important positions.

The OSTP has the important role of leading and coordinating interagency efforts to develop and implement science and technology policies and budgets across the Federal Government. This often means managing dozens of agencies' participation and input on a single policy issue, which can be a difficult task.

The OSTP also has the job of working with our private sector to ensure that Federal investments in science and technology contribute to our Nation's economic prosperity. Dr. Simon, who will cover the areas of environment and energy at OSTP, is no stranger to the Senate. As I'm sure has already been mentioned, his 20 year career on the Energy and Natural Resources Committee will, I hope, help facilitate productive relationships between the executive branch and Congress.

I am interested, of course, on his perspective and thoughts in forest health R&D which, he mentioned, is a topic of interest, and his meeting with the Committee staff and the subject of mining education and research which are key components of the energy value chain.

Our other OSTP nominee, Dr. Handelsman, has impressive credentials and is a prolific author on technical subjects within the field of microbiology as well as science education. In particular, I would like to hear her opinions about how agriculture R&D may contribute to the food supply and food security. I am hopeful that, in her position covering the science and STEM portfolio at OSTP, she can provide leadership on the issue of STEM education and work with Members of Congress to improve coordination of these programs across the Federal Government.

I also hope that both of these nominees will work with this committee as it considers legislation to reauthorize the America Competes Act later this year.

After serving at the helm of NOAA, as Acting Administrator for nearly 7 months now, I'm pleased to see that Dr. Kathy Sullivan has been nominated to lead this important agency. In areas such as weather forecasts, severe storm warnings, fisheries management, and support for marine commerce, NOAA impacts the readiness and livelihoods of Americans on a daily basis.

As an administrator, Dr. Sullivan will be responsible for all of this and more. While she has already made significant strides in providing steady leadership through this tough and uncertain fiscal environment, I look forward to hearing Dr. Sullivan's views today in learning more about her vision for NOAA moving forward.

I would also like to take this opportunity to personally extend an invitation to all of you to visit South Dakota. We have some exciting cutting edge research going on in our state at the Sanford Underground Research Facility, otherwise known as SURF, which is located in the old Homestake Mine in Lead, South Dakota. Physics researchers are leading the Large Underground Xenon, or LUX, experiment to detect the existence of dark matter.

The South Dakota School of Mines and Technology in Rapid City is collaborating with our land grant, South Dakota State University in Brookings, to constitute the Center for Bioprocessing Research and Development, which is making discoveries in feedstock development, bioprocessing microbes and enzymes, and biofuels that will enable bioindustries to meet U.S. energy needs.

So Mr. Chairman, I expect that we can advance these nominations through the Committee and hopefully the Senate, in a timely manner and I appreciate your holding the hearing today. I look forward, again, to the testimony and the opportunity to interact with our nominees and am very much anxious to hear the responses to our questions. So thank you again for having the hearing and thank you all for being here.

Senator NELSON. OK, Dr. Handelsman.

STATEMENT OF DR. JO HANDELSMAN, NOMINEE TO BE ASSOCIATE DIRECTOR FOR SCIENCE, WHITE HOUSE OFFICE OF SCIENCE AND TECHNOLOGY POLICY

Dr. HANDELSMAN. Chairman Nelson, Ranking Member Thune, and Committee members, I am honored to be here today as President Obama's nominee for the position of Associate Director for Science in the Office of Science and Technology Policy. I am also pleased to have the opportunity to tell you a bit about what motivated me to become a scientist, first in academia and now, if confirmed, in public service.

Two experiences stand out as critical influences on my career and scientific choices. The first was in my seventh grade science class, where I looked through a microscope for the very first time and I saw the magnificent world of microorganisms. At that moment, I knew I wanted to become a scientist. That glimpse of the microscopic world not only motivated me, but also changed my attitudes and ideas about science education.

I believe that every student should have the opportunity to have their microscope moment, as I did. Students need to learn science by thinking about science, learning to think like scientists, and doing science, not just reading about the science that others have generated that ends up in a textbook. And they need to have teachers who inspire them and foster scientific thinking.

I know this Committee shares my commitment to improving U.S. Science and engineering education and I would welcome the opportunity to work with you on this important challenge that faces our Nation.

The second experience that shaped me very much as a scientist was my mother's death. That loss was deepened by the fact that she died with an infection with antibiotic-resistant bacteria, precisely the focus of my own research. So after 20 years of seeking new antibiotics, I stood by helplessly as my mother suffered and eventually died of disease because we lacked sufficient antibiotics to help her. And my mother's case is just one of many Americans who die of infectious disease caused by antibiotic-resistant bacteria. And despite it being one of the greatest threats to our healthy in the future, I think we invest insufficiently in the problem in our research portfolio.

Infectious disease is probably just one of the many challenges that face us that can be addressed with science and also one of quite a few that we under-invest in. And so if I have the honor of being the Associate Director for Science, I would help to ensure that America's research portfolio was balanced and addressed the most serious risks that our Nation faces.

I bring to these challenges the experience and wisdom of four decades of looking through microscopes and 28 years as a professor, first at the University of Wisconsin and then, more recently, at Yale. If confirmed, I would be honored to use the skills and experience that I've gained to serve the American people in strengthening science and technology education and research.

I thank you for having me here today and I, of course, would be happy to answer your questions.

[The prepared statement and biographical information of Dr. Handelsman follow:]

PREPARED STATEMENT OF DR. JO HANDELSMAN, NOMINEE, ASSOCIATE DIRECTOR FOR SCIENCE, WHITE HOUSE OFFICE OF SCIENCE AND TECHNOLOGY POLICY

Chairman Rockefeller, Ranking Member Thune, and Committee members, I am honored to be here today as President Obama's nominee to serve as the Associate Director for Science in the White House Office of Science and Technology Policy. I am pleased to have this opportunity to introduce myself, to tell you a little about what inspires me, and to discuss what I would hope to accomplish, if confirmed, in this position of public service.

Many experiences contributed to my decision to pursue a career as a scientist—and to apply my knowledge and skills to public service—but two experiences in particular stand out.

When I was 12 years old, I looked through a microscope for the first time and saw a microscopic organism swimming about in a world that had been invisible and completely unknown to me. It was a revelatory experience, and at that moment I knew I wanted to become a scientist. From that day on, I didn't really want to do much else besides look through a microscope at whatever I could find—to explore this tiny yet amazingly complex ecosystem of living things. So I did enough babysitting for the next six months to save up $72 to buy a wonderful old microscope that had been used in European hospitals in the 1930s and somehow had made its way across the ocean to America. I still have that microscope today. And the universe it introduced me to was—and continues to be—no less wondrous than the one that today's astronomers—and perhaps a few Senators—marvel at as they look through their giant telescopes to the outer limits of space.

All students should be able to have their own "microscope moments". Most will not decide to follow the path that I did, but the right experiences in classrooms and on field trips can teach them the important lesson that science is not about facts in a textbook, but about exploring the world around us, about discovery, about puzzles, and about problem solving. The understanding that science is not a body of facts but rather a *process*—a way of asking questions and solving problems—is increasingly important for all of us, as personal and societal decision-making is increasingly dependent on our ability to interpret and make judgments about scientific data.

But it is also important on a larger scale, because science and technology today are also essential for our Nation's continued innovation, competitiveness, and economic strength. If America is to maintain its leadership position in the world it is absolutely necessary that we as a nation inspire a new generation of Americans to excel in science, technology, engineering, and mathematics—the so-called STEM subjects. As you may know, I co-chaired a working group of the President's Council of Advisors on Science and Technology that prepared the report, *Engage to Excel,* which focused on the pending shortfall of domestically trained scientists and engineers for the U.S. workforce and called for actions to increase by one million the number of college graduates with STEM degrees over the next decade. Our working group concluded that a critical aspect of attracting more students to STEM careers is providing those "microscope moments" to students throughout science education. I know that the Congress and the Administration share this important goal and, if confirmed, I would welcome the opportunity to help improve our citizens' understanding of science and inspire more young people to become scientists and engineers.

The second experience that has shaped me as a scientist and inspired me to apply my skills on the scale of Federal service was my mother's death. The pain of that loss was deepened because she died from an infection with antibiotic-resistant bacteria—precisely the focus of my own research. After 20 years of seeking new antibiotics and inventing new ways to find them, I stood by helplessly watching my mother suffer because we still lacked sufficient antibiotics to save her. And my mother's case is a personal example of the type of infectious disease that kills many thousands of Americans each year. Antibiotic-resistant bacteria represent one of the greatest health threats confronting us today, and also represent a gap in our federally funded research portfolio.

That experience intensified my search for new antimicrobials and inspired many studies of antibiotic resistance in my lab. But beyond that, it connected me with a problem of national and even global significance, as antimicrobial resistance is a major problem around the world, and it forced me to consider the U.S. biomedical research agenda in a personal way. It stimulated me to think hard about strategic investment in science and the prioritization of precious resources.

As you know, Mr. Chairman, OSTP serves as a coordinating office for many scientific and technological endeavors that cross department and agency lines. If confirmed, I can promise that I will bring all of my personal and professional power to bear to ensure that America's research portfolio is balanced with regard to the most serious risks we face as a nation, and that critical gaps are addressed methodically but aggressively, as American taxpayers appropriately expect.

Finally, I should note that none of this can be accomplished by the Federal Government alone, and academic researchers and teachers have a huge role to play. Toward that end of partnering with and leveraging the immense potential of academic science and science education, I bring 28 years of experience as a professor at two great universities—the University of Wisconsin and Yale University—which have provided me with an understanding of the responsibilities and contributions of both public and private institutions. If confirmed, I would be honored to serve the people of the United States by helping to focus this Nation's diverse public and private resources on the task of ensuring that U.S. policies effectively bolster scientific research and education.

Thank you for having me here today, and I would be happy to answer your questions.

A. BIOGRAPHICAL INFORMATION

1. Name (Include any former names or nicknames used):

Legal name: Jo Emily Handelsman
Former name: Joanne Emily Handelsman

2. Position to which nominated: Associate Director for Science in the Office of Science and Technology Policy.
3. Date of Nomination: July 31, 2013.
4. Address (List current place of residence and office addresses):

Residence: Information not released to the public.

Office: Yale University, Department of Molecular, Cellular & Developmental Biology, 219 Prospect Street, 904 Kline Biology Tower, New Haven, CT 06511.

5. Date and Place of Birth: March 19, 1959; New York City.

6. Provide the name, position, and place of employment for your spouse (if married) and the names and ages of your children (including stepchildren and children by a previous marriage).

Spouse: Casey Nagy, Special Assistant to the Vice President, Yale University; Director, Yale-NUS College Office—New Haven, Yale (collaboration with the National University of Singapore). Children: Erin Nagy, stepdaughter, 26 years old Nathan Nagy, stepson, 21 years old.

7. List all college and graduate degrees. Provide year and school attended.

B.S. 1979 Cornell University, Agronomy
Ph.D. 1984 University of Wisconsin-Madison, Molecular Biology

8. List all post-undergraduate employment, and highlight all management-level jobs held and any non-managerial jobs that relate to the position for which you are nominated.

Note: Management-level positions are indicated below with an asterisk.

Yale University Positions

- *2010 to present, Director, The Center for Scientific Teaching at Yale
- 2010 to present, Professor, Department of Molecular, Cellular and Developmental Biology
- 2011 to present, Frederick Phineas Rose Professor
- 2002 to present, Howard Hughes Medical Institute Professor

University of Wisconsin Positions

- *2007–2009, Professor and Chair, Department of Bacteriology
- *2002–2010, Director, Wisconsin Program for Scientific Teaching
- *1997–1999, Director, Institute for Pest and Pathogen Management,
- 1995–2007, Professor, Department of Plant Pathology
- 1991–1995, Associate Professor, Department of Plant Pathology
- 1985–1991, Assistant Professor, Department of Plant Pathology
- 1984–1985, Postdoctoral Fellow, Department of Plant Pathology

Other Positions Relevant to Nominated Position

- 2012 to present, Series Editor, “Entering Mentoring,” the Wisconsin Program for Scientific Teaching
- 2003 to present, Series Editor, *Controversies in Science and Technology (*unpaid), published by University of Wisconsin Press
- *2006–2012, President, Rosalind Franklin Society (unpaid)
- *2004–2012, Co-Director (with Bill Wood, University of Colorado), National Academies Summer Institute on Undergraduate Education in Biology
- 2007–2011, Editor-in-Chief, *DNA and Cell Biology* (unpaid), published by Mary Ann Liebert, Inc. Publishers
- *2001–2007, Co-Director (and Co-Founder), Women in Science and Engineering Leadership Institute (WISELI)
- 2005–2008, Editor, *Applied and Environmental Microbiology* (unpaid), published by the American Society for Microbiology
- 2005–2008, Editor, *Cell Biology Education* (unpaid), published by the American Society for Cell Biology

9. Attach a copy of your resume. A copy is attached.

10. List any advisory, consultative, honorary, or other part-time service or positions with Federal, State, or local governments, other than those listed above, within the last five years.

Co-chair, President’s Council of Advisors on Science and Technology (PCAST) Working group on Science Technology Engineering and Math (STEM) in Higher Education (2011–2012)

Member, PCAST Working group on K–12 STEM Education (2010–2011)

11. List all positions held as an officer, director, trustee, partner, proprietor, agent, representative, or consultant of any corporation, company, firm, partnership, or other business, enterprise, educational, or other institution within the last five years.

- American Society for Microbiology, President, (2013 to present)

- American Society for Microbiology, President-elect (2012–2013)
- University of Wisconsin, STEM Diversity Project, Advisory Committee, Committee Member (2012 to present)
- National Academy of Sciences, Board on Life Sciences, Chair (2012 to present)
- Lehigh University, ADVANCE Program, External Advisory Committee, Committee Member (2011 to present)
- University of Minnesota, STEM Education Initiative, Advisory Committee, Committee Member (2011 to present)
- Harvard School of Public Health, Board of Overseers, (2009 to present)
- National Academies Summer Institutes on Science Education, Executive Committee, Co-chair (2012–2013)
- American Society for Microbiology, President-elect (2012–2013)
- Rosalind Franklin Society, President; (2006–2012)
- American Academy of Microbiology, Committee on Colloquia, Committee Member; (2007–2011)
- Institute of Medicine of the National Academies, Forum on Microbial Threats, Member; (2005–2010)
- Member Advisory Committee Wellness Center for Alternative Medicine, Madison WI (non-profit clinic that provides alternative medicine for low-income people), member; (2007–2008)
- Handelsman Investments, LLC, Partner, (2001–2008, dates are approximate)

12. Please list each membership you have had during the past ten years or currently hold with any civic, social, charitable, educational, political, professional, fraternal, benevolent or religious organization, private club, or other membership organization. Include dates of membership and any positions you have held with any organization. Please note whether any such club or organization restricts membership on the basis of sex, race, color, religion, national origin, age, or handicap.

- American Society for Microbiology (1983 to present; currently President-Elect)
- American Association for the Advancement of Science (Member, 1985 to present; currently member of Nominating Committee and Councilor-at-large)
- The International Society for Molecular Plant-Microbe Interactions (1989–2009)
- American Phytopathological Society (~1985–2007)
- Soil Science Society of America (2003)
- The International Society for Microbial Ecology (1998 to present)
- The Rosalind Franklin Society (President 2007–2012)
- Connecticut Academy of Science and Engineering (2012 to present)
- American Civil Liberties Union (1985 to present)
- American Automobile Association (1990 to present)
- Harbor Athletic Club, Middleton WI (2000–2011)
- Planet Fitness, North Haven, CT (2009 to present)
- Young Men's Christian Association, Branford, CT (2011 to present)
- National Academies Summer Institutes on Science Education, Executive Committee, Co-chair (2012 to present)

13. Have you ever been a candidate for and/or held a public office (elected, non-elected, or appointed)? If so, indicate whether any campaign has any outstanding debt, the amount, and whether you are personally liable for that debt. No.

14. Itemize all political contributions to any individual, campaign organization, political party, political action committee, or similar entity of $500 or more for the past ten years. Also list all offices you have held with, and services rendered to, a state or national political party or election committee during the same period. None.

15. List all scholarships, fellowships, honorary degrees, honorary society memberships, military medals, and any other special recognition for outstanding service or achievements.

2013—Bard College, Honorary Doctor of Science

2013—American Society for Microbiology Graduate Mentoring Award

2012—Named one of the "Ten People Who Mattered this Year" by *Nature* magazine

2012—Connecticut Academy of Science and Engineering, Elected Member

2011—Presidential Award for Excellence in Science, Engineering, and Math Mentoring

2011—American Society for Microbiology DC White Research and Mentoring Award

2011—Frederick Phineas Rose Professorship, Yale University

2010—American Institute of Biological Sciences (AIBS) Education Award

2009—American Society for Microbiology Carski Foundation Distinguished Undergraduate Teaching Award

2009—Named "Revolutionary Mind" by Seed Magazine 2009—Association for Women in Science, Fellow

2008—American Association for the Advancement of Science, Fellow

2008—National Research Council, National Associate

2008—American Society for Microbiology Roche Diagnostics Alice C. Evans Award

2006—Young Women's Christian Association Woman of Distinction Award

2004—National Academies Education Mentor in the Life Sciences

2003—American Academy of Microbiology, Fellow

2002—Howard Hughes Medical Institute Professor

2002—Clark Lecturer in Soil Biology, Soil Science Society of America

1998—Cabinet 99 Recognition Award, University of Wisconsin

1995—Chancellor's University Teaching Award, University of Wisconsin Sciences, University of Wisconsin

1988—Chancellor's Research-Service Award, University of Wisconsin

1984—1985 National Institutes of Health (NIH) Postdoctoral Fellowship

1984—American Cancer Society Postdoctoral Fellowship

1979—Honors, Cornell University

16. Please list each book, article, column, or publication you have authored, individually or with others. Also list any speeches that you have given on topics relevant to the position for which you have been nominated. Do not attach copies of these publications unless otherwise instructed.

I have done my best to identify all books, articles, columns or publications, including through a review of my personal files and searches of publicly available electronic databases. Despite my searches, there may be additional presentations that I have been unable to identify, find, or remember. I have located the following:

Publications: Microbiology

Shade, A., J.G. Caporaso, J. Handelsman, R. Knight, and N. Fierer. 2013. A meta-analysis of changes in bacterial and archaeal communities with time. ISME Journal. In press.

Shade, A., P.S. McManus, and J. Handelsman. 2013. Unexpected diversity during community succession in the apple flower microbiome. mBio. 4(2): e00602–12. doi:10.1128/mBio.00602–12.

Shade, A., H. Peter, S.D. Allison, D. Baho, M. Berga, H. Buergmann, D.H. Huber, S. Langenheder, J.T. Lennon, J.B. Martiny, K. Matulich, T.M. Schmidt, and J. Handelsman. 2012. Fundamentals of microbial community resistance and resilience. Frontiers in Microbiology. 3: 417. doi: 10.3389/fmicb.2012.00417.

Araujo J.F., A.P. de Castro, M.M. Costa, R.C. Togawa, G.J. Júnior, B.F. Quirino, M.M. Bustamante, L. Williamson, J. Handelsman, and R.H. Krüger. 2012. Characterization of soil bacterial assemblies in Brazilian savanna-like vegetation reveals acidobacteria dominance. Microbial Ecology. 64(3): 760–770.

Shade, A., C.S. Hogan, A.K. Klimowicz, M. Linske, P.S. McManus, and J. Handelsman. 2012. Culturing captures members of the soil rare biosphere. Environmental Microbiology. 14(9): 2247–2252.

McMahon, M.D., C. Guan, J. Handelsman, and M.G. Thomas. 2012. Metagenomic analysis of *Streptomyces lividans* reveals host-dependent functional expression. Applied and Environmental Microbiology. 78: 3622–3629.

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de Castro, A.P., B.F. Quirino, H. Allen, L.L. Williamson, J. Handelsman, and R.H. Kruger. 2011. Construction and validation of two metagenomic DNA li-

braries from Cerrado soil with high clay content. Biotechnology Letters. 33: 2169–2175.

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Maloy, S., J. Handelsman, and S. Singh. 2011. Dynamics of host-associated microbial communities. Microbe. 6: 21–25.

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Borlee, B.R., G.D. Geske, H.E. Blackwell, and J. Handelsman. 2010. Identification of synthetic inducers and inhibitors of the quorum-sensing regulator LasR in *Pseudomonas aeruginosa* by high-throughput screening. Applied and Environmental Microbiology. 76(24): 8255–8258.

Klimowicz, A.K., T.A. Benson, and J. Handelsman. 2010. A quadruple-enterotoxin-deficient mutant of *Bacillus thuringiensis* remains insecticidal. Microbiology. 156: 3575–3583.

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Donato, J., L.A. Moe, B.J. Converse, K.D. Smart, F.C. Berklein, P.S. McManus and J. Handelsman. 2010. Metagenomic analysis of apple orchard soil reveals antibiotic resistance genes encoding predicted bifunctional proteins. Applied and Environmental Microbiology. 76(13): 4396–4401.

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Handelsman, J. 2009. Metagenetics: Spending our inheritance on the future. Microbial Biotechnology. 2(2): 138–139.

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Allen, H. K., L.A. Moe, J. Rodbumrer, A. Gaarder, and J. Handelsman. 2008. Functional metagenomics reveals diverse &beta;-lactamases in a remote Alaskan soil. ISME Journal. 3: 243–251.

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Broderick, N.A., K.R. Raffa, and J. Handelsman. 2006. Midgut bacteria required for *Bacillus thuringiensis* insecticidal activity. Proceedings of the National Academy of Sciences. 103(41): 15196–15199.

Chan, Y.A., M.T. Boyne, A.M. Podevels, A.K. Klimowicz, J. Handelsman, N.L. Kelleher, and M.G. Thomas. 2006. Hydroxymalonyl-acyl carrier protein (ACP) and aminomalonyl-ACP are two additional type I polyketide synthase extender units. Proceedings of the National Academy of Sciences. 103(39): 14349–14354.

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Peterson, S.B., A.K. Dunn, A.K. Klimowicz, and J. Handelsman. 2006. Peptidoglycan from *Bacillus cereus* mediates commensalism with rhizosphere bacteria from the *Cytophaga-Flavobacterium* group. Applied and Environmental Microbiology. 72: 5421–5427.

Schloss, P.D., I. Delalibera, J. Handelsman, K.F. Raffa. 2006. Bacteria associated with the guts of two wood-boring beetles: *Anoplophora glabripennis* and *Saperda vestita* (Cerambycidae). Environmental Entomology. 35: 625–629.

Schloss, P.D. and J. Handelsman. 2006. Introducing TreeClimber, a test to compare microbial community structures. Applied and Environmental Microbiology. 72: 2379–2384.

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Handelsman, J. 2006. Metagenomics or megagenomics? Nature Reviews Microbiology. 3: 457–458.

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Publications: Education, Women in Science

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Books: Education

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Fine, E. and J. Handelsman, eds. 2012. *Searching for excellence & diversity: A guide for search committees.* WISELI. 126 pp.

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Publications: Editorials

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Handelsman, J. 2011. Highlights from the July 2011 issue of DNA and Cell Biology. DNA and Cell Biology. 30(7): 431.

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Handelsman, J. and R.A. Grymes. 2008. Looking for a few good women? DNA and Cell Biology. 27(9): 463–465.

Felnagle, E. and Handelsman, J. 2008. Commonalities in sickness and in health. DNA and Cell Biology. 27(7): 345–346.

Handelsman, J. 2008. Call for papers: Unique model systems. DNA and Cell Biology. 27(6): 287.

Handelsman, J. 2008. Metagenomics is not enough. DNA and Cell Biology. 27(5): 219–221.

Handelsman, J. 2008. Youth matters. DNA and Cell Biology. 27(3): 115.

Handelsman, J. 2008. The gray zone: Scientific misconduct comes in many shades. DNA and Cell Biology. 27(2): 63–64.

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Handelsman, J. 2007. Help wanted: Newspapers seek Ph.D.'s in biomedical sciences. DNA and Cell Biology. 26(12): 809–810.

Handelsman, J. and Birgeneau, R. 2007. Women advancing science. DNA and Cell Biology. 26(11): 763–764.

Speeches, Talks, and Panel Discussions

1996

- American Society for Microbiology (ASM) Annual Meeting, Atlanta, GA, Microbial Interactions Research
- International Society of Chemical Ecology Meeting, Cornell University, plenary address
- ASM Microbial Diversity Meeting, Plant-Microbe Symbioses
- 9th International Congress of Molecular Plant-Microbe Interactions, Chemical biology of plant disease suppression by Bacillus cereus
- NIH NRSA meeting, antibiotic resistance in Staph aureus

1998

- National Association of University Attorneys, workshop on sexual harassment and the law
- University of Kentucky, Molecular and ecological underpinnings of biological control of plant disease
- University of Georgia, Molecular and ecological underpinnings of biological control of plant disease
- University of Minnesota, Molecular and ecological underpinnings of biological control of plant disease

2001

- Various venues, From Socrates to Feminists: active learning in the classroom
- 101st ASM Meeting, Education Conference, The Golden Ages of Microbiology Education
- 101st ASM Meeting, Environmental Microbial Genomics
- Frontiers in Genomics, Communication between Bacillus cereus and its environment
- Keystone Conference, Metagenomics of Environmental Microbes, Bacteria and Their Environments

2002

- Stanford University, Research on Microbial Interactions
- Department of Energy Genomes to Life Principal Investigators' Meeting, invited presentation
- Woods Hole Marine Biology Laboratory, Microbial Diversity Course, class lecture
- NSF meeting for Microbial Observatories Principal Investigators, keynote address
- American Soil Science Society of America, award lecture
- Howard Hughes Medical Institute, invited presentation on education
- NSF ADVANCE Program PI's meeting, presentation on women in science

2004

- Howard Hughes Medical Institute—Professors' meeting, presentation on teaching
- Howard Hughes Medical Institute—Investigators' meeting, invited presentation on teaching
- NSF Microbial Observatories meeting, research presentation
- American Society for Microbiology, Microbial Ecology Division N lecture
- ASM Conference on Cell—Cell Communication, invited research presentation
- DARPA Meeting on Endogenous Host Defenses, invited research presentation
- National Academy of Sciences Beckman Frontier Symposium, invited research presentation
- University of Maryland-Baltimore County Symposium on Interdisciplinary Biology Education, invited presentation on teaching
- Conference on Microbial Communities and Infectious Disease, Pasteur Institute invited research presentation

2008

- 4/24/08, Marvin A. Brennecke Lecture, Washington University in St. Louis, Phalanx or Traitors? Microbial communities in the gypsy moth gut
- 5/21/08, Forum on Microbial Threats, IOM; Washington, DC, Expanding the resistance universe with metagenomics
- 6/1/08, ASM General Meeting, Boston, MA, Beyond Bias and Barriers
- 7/28/08, APS Centennial Meeting, Minneapolis, MN, (1) Apples and antibiotics: Metagenomic discovery of antibiotic resistance genes in orchard soil (2) Phalanx or traitors?—Signaling in microbial communities and host health

- 10/2/08, Distinguished Lecture, University of Colorado in Boulder, (1) Phalanx or Traitors? The role of microbial communities in host health (2) The Fallacy of Fairness: Why Not Apply Science to the Scientists?
- 10/28/08, Frontiers in Pharmacology, UW-Madison, Conversations Among the Unseen: Molecular Signaling in Microbial Communities
- 11/4/08, Chaos and Complex Systems Seminar, UW-Madison, Conversations with the silent majority in soil microbial communities
- 11/25/08, Fourth Tuesday Group, UW-Madison Phalanx or Traitors?, The role of microbial communities in host health
- 12/6/08, Higher Education Seminar: Following the Money in Tough Times, Hechinger Institute, Columbia University, Revolution in the Science Classroom: Energizing Science and Engineering Instruction (with Donald Giddens of Georgia Tech)

2009

- 1/27/09, FRESH seminar, UW-Madison, The Many Faces of Bacillus cereus and its Friends
- 2/5/09, Evolution Group, UW-Madison, invited research presentation
- 2/10/09, Genomics: GTL, Bethesda, MD, invited research presentation
- 2/18/09, The American Association for the Advancement of Science (AAAS) Annual Meeting, Teaching Science in a Large Public University
- 3/3/09, IOM Forum on Microbial Threats, Washington, DC, Antibiotic Use in Agriculture, AMR, and Antimicrobial Discovery: An Ecological Perspective
- 3/13/09, University of Michigan Microbial Ecology Symposium, Phalanx or Traitors? The role of microbial communities in host health
- 3/23/09, Seminar in: Topics in Agricultural Biotechnology UW-Madison, Biocontrol of pest and pathogens in agriculture and forestry
- 3/25/09, Soils Department seminar, UW-Madison, Seeing the Unseen: The Soil Metagenome in an Alaskan Boreal Forest
- 4/9/09, Dept. of Microbiology, University of Illinois, Urbana—Champaign seminar, Phalanx or Traitors? The role of microbial communities in host health
- 4/17/09, Auburn University WISE Institute Faculty seminar, The Fallacy of Fairness: Why Not Apply Science to the Scientists?
- 4/20/09, Yale University seminar, New Haven, CT, Metagenomics to Metagenetics: Dissection of Microbial Communities in Soil and Caterpillar Guts
- 4/29/09, Food Research Institute Spring Meeting, UW-Madison, Antibiotic Resistance and the Food Supply
- 5/5/09, Academy Evenings in Madison, UW-Madison, Microorganisms: Calamity and Salvation for the Earth and Its Residents
- 5/17/09, The American Society for Microbiology (ASM) General Meeting, invited research presentation
- 8/17/09, Society for Industrial Microbiology Conference, Park City, Utah, *Bacillus thuringiensis,* resident gut microbiota, and innate immunity in lepidopteran insects
- 11/19/09, Harvard University Department of Organismic and Evolutionary Biology, Phalanx or Traitors? Role of the gut microbial community in the health of lepidopteran insects
- 12/3/09, Delaware Biotechnology Institute, Listening to the silent majority: antibiotic resistance among uncultured bacteria in soil
- 12/10/09, Rosalind Franklin Society, President and Speaker

2010

- 3/11/10, National Institute of General Medical Sciences, invited research presentation
- 4/28/10, Yale University Science and Engineering Forum invited research presentation
- 6/28/10, Gordon Research Institute, invited research presentation
- 7/14/10, Howard Hughes Medical Institute Professors Meeting, presentation on teaching

- 8/4/10, HHMI BIO 2020: Developing the Next Generation, Scientific Teaching in the Summer
- 8/23/10, ISME13, invited research presentation
- 8/30/10, Raper Symposium, UW-Madison, Symbiosis between caterpillars and gut microbial communities
- 9/3/10, MCGD Track Talk, Yale University, Metagenomics and Microbiomes: Molecular bases of bacterial ecology and diversity
- 10/15/10, Jane Coffin Childs Postdoctoral Fellows Symposium, invited research presentation
- 10/22/10, Brown Friday Chemistry Colloquium; Yale University, Chemical Ecology of Caterpillar-Microbe Interactions
- 11/11/10, Evolutionary Medicine course lecture, Guest Lecturer
- 12/7/10, University of Connecticut Department of Molecular Biology, The commensal-to-pathogen switch in an insect microbiome

2011

- 1/26/11, Presidential Award in Science, Engineering, and Math Mentoring award lecture
- 1/28/11, Science Education Colloquia, Yale University, What is Scientific Teaching?—The Changing Landscape of Science Education
- 2/2/11, University of Maryland, Scientific Teaching: Evidence for change in science education
- 2/19/11, AAAS Annual Meeting, What about the "how" in education change?
- 3/3/11, CBIO/GENE/MCDB 901b, Yale University Guest Lecturer
- 3/4/11, Perspectives on Science and Engineering, Yale University Microbes and Us: Why we should respect our bacterial friends
- 3/28/11, University of Colorado Symposium, Science on FIRE: Facilitating Interdisciplinary Research and Education invited presentation on education
- 4/5/11, Galston Lecture, Yale University, The Future of Our Microbial Planet
- 4/15/11, Morehouse Division of Science and Mathematics Faculty Development Workshop invited research seminar
- 4/18/11, National Academy of Sciences DELS Dimensions of Microbiology, Probing microbial communities with metagenomics and chemistry
- 5/13/11, Yale Chemical Biology Symposium, Antibiotics and Signals in Microbial Communities
- 5/22/11, ASM Gen Mtg: DC White Research and Mentoring Award Lecture, Language Metaphors in Microbial Ecology
- 5/28/11, Yale College Reunions, The Future of the Microbial Planet
- 6/2/11, ASMCUE, Scientific Teaching: Evidence for change in science education
- 6/6/11, Mastering Metagenomics Short Course, Yale University Metagenomics & Beyond
- 6/8/11, Wind River Conference on Prokaryotic Biology, (1) Scientific Teaching: Evidence for change in science education, (2) It Takes a Village: Cooperation and antagonism in the caterpillar gut microbial community
- 7/21/11, SCHOLAR enrichment speaker, Yale University, Commensals to Pathogens
- 7/29/11, Med School New Faculty Speaker, Yale, invited presentation on mentoring
- 9/20/11, Yale Digestive Diseases Seminar, Strategy and Serendipity in Academic Careers
- 9/26/11, Stony Brook University Seminar, (1) Scientific Teaching: Launching a Revolution in Science Education, (2) Phalanx or traitor? Impact of gut microbial communities on insect health
- 10/11/11, CIRTL Forum; Madison, WI, A Revolution in Science Education: From fringe activity to national mandate
- 11/3/11, University of Georgia Microbiology Department, Phalanx or traitor? Impact of gut microbial communities on insect health
- 11/28/11, MB&B Seminar Series, Yale University, Molecular Diversity in Microbial Communities

2012

- 1/20/12, Johns Hopkins Symposium on Teaching Excellence in the Sciences, National trends in the transformation of STEM education
- 2/15/12, Yale EEB Seminar Series, Metagenomic analysis of antibiotic resistance in the environment
- 3/1/12, NIH Wednesday Afternoon Lecture, Phalanx or traitor? Impact of gut microbial communities on insect health
- 3/2/12, AWIS Bethesda, Improving College STEM Education
- 3/6/12, Institute of Medicine Forum on Microbial Threats, Interspecies interactions among rhizosphere and soil bacteria
- 3/16/12 MIT Education Group Seminar, Engage to excel: A national perspective on science education
- 5/12/12 Yale Talks About Drug Discovery Symposium, Organizer, Speaker, Panel Member
- 5/18/12 28th New Phytologist Symposium; Rhodes, Greece, Keynote speaker: The Plant Microbiome: Uniquely Green Microbiology
- 6/1/12,Yale Alumni Event, The Future of the Microbial Planet
- 6/17/12, ASM General Meeting, Microbial modulation of diversity and disease in the caterpillar gut
- 8/4/12, American Phytopathological Society Annual Meeting, From Metagenomics to Metabolomics: Communication in the Rhizosphere
- 9/30/12, ASM Education Board, Small World Initiative
- 10/9/12, HHMI Undergraduate Science Education meeting, The nature of student persistence in STEM: PCAST and beyond
- 10/15/12, Yale Office of Research Administration, One microbiologist's view of research: Discovering antibiotics, improving teaching, and including more people in science
- 11/5/12, Microbial Community Dynamics: Cooperation and Competition workshop in St. Louis, Molecular and functional diversity of environmental microbial communities
- 11/19/12, The National Academies Committee on Women in Science, Engineering, and Medicine Committee Meeting, A Perspective on Recent Relevant Research & Implications for CWSEM
- 12/11/12, Institute of Medicine Forum on Microbial Threats 15th Anniversary, From the war metaphor to the microbial planet

2013

- 1/14/13, Yale Physics Club, The Fallacy of Fairness: Rethinking the Meritocracy of Science
- 1/25/13, University of Pennsylvania Phoebe Leboy Lecture, The Fallacy of Fairness: Progress and Challenges for Women in Science 2013
- 2/14/13, AAAS Annual Meeting Workshop on Responsible Professional Practices, Mentoring and being mentored
- 2/16/13, AAAS Annual Meeting, A Persistence Framework: A New Look at STEM Retention and the Undergraduate Experience
- 3/6/13,Harvard University Medical School Joint Committee on the Status of Women, Addressing Subtleties in Gender Bias in Academic Medicine, panelist
- 3/11/13, Penn State Center for Excellence in Science Education Seminar, National trends in the transformation of STEM education
- 3/12/13, Penn State Distinguished Lecture in the Life Sciences, The rest of the biosphere: Metagenomics reveals unexpected species and genes in natural habitats
- 3/20/13, Ivy Plus Equal Opportunity/Diversity Officers Meeting at Yale University, Unconscious Bias
- 4/3/13, Women Faculty Forum, The Double Blind: Bias and belief systems in science
- 3/28/13, Johns Hopkins Universities, Call of the wild: Antibiotic resistance genes in diverse habitats

- 4/8/13, NIH Dynamics of Host-Associated Microbial Communities Conference, Retrospective Musings
- 4/15/13, AAU Spring Presidents Meeting, invited presentation on education
- 4/18/13, Yale Class of 1950 Reunion, The Future of the Microbial Planet

17. Please identify each instance in which you have testified orally or in writing before Congress in a governmental or non-governmental capacity and specify the date and subject matter of each testimony. None.

18. Given the current mission, major programs, and major operational objectives of the department/agency to which you have been nominated, what in your background or employment experience do you believe affirmatively qualifies you for appointment to the position for which you have been nominated, and why do you wish to serve in that position?

I am deeply committed to the proposition that robust scientific and technological discovery, coupled with effective science education, is essential to a strong economy and a truly democratic society. Through its policies and strategic investments, the United States has fostered the world's premier science and technology engine, which has catalyzed the growth of the country's technology industry and the U.S. economy more generally over the past 50 years. I wish to contribute to the future of this engine by providing counsel based on the best and most accurate knowledge of emerging areas in science and technology. If confirmed as Associate Director for Science in the Office of Science and Technology Policy, I would bring extensive experience not only in my primary area of microbiology but also in biomedical sciences more broadly, as well as expertise in agricultural technology, environmental science, human diversity in science, and—of great importance for this job—science, technology, engineering, and math (STEM) education. I anticipate developing and contributing to creative initiatives that will strengthen U.S. scientific research and education and propel the United States toward meeting our industrial workforce needs of the 21st Century.

But the importance of science and science education reaches beyond this foundational economic priority. In my experience communicating science to the public, I find that people are eager to learn science and want to be inspired and enthralled by discovery. In this age of high technology and specialized science, it is especially satisfying to excite the human imagination with the fantastic feats of modern science. By their very nature, the acts of problem-solving and discovery cultivate attitudes of hope and optimism—traits that have driven this country to greatness from its earliest days. Serving the government and citizens of the United States by informing and advising about science would be an unrivaled honor and privilege.

Four features of my career have prepared me for this position: my broad training and interests in science and technology; my research in and innovative approaches to science education; my insistence that the public be better informed about science; and my creative and inclusive leadership style.

Breadth in Science and Technology. The Associate Director for Science has a portfolio that spans the breadth of science. My formal education, in Agronomy and Molecular Biology, represents fields that are different in scientific content, outlook, and scale. Agronomy is an applied science focused on improving crop performance and soil health, whereas molecular biology is a fundamental science that aims to understand the inner workings of cells across all organisms. Over the last 28 years, my research group has pushed the boundaries of established fields of microbiology. We also contributed to the pioneering of metagenomics, a field that I named. Metagenomics is the study of a mixture of genomes from all of the different bacteria in a community. Metagenomics provides access to the information locked up in bacteria that cannot be studied by traditional techniques because they are recalcitrant to culturing in the laboratory. My research has focused on problems at the economically pivotal intersection of microbiology with agriculture (such as using bacteria to control insect pests) and medicine (such as discovering new antibiotics), as well as in basic microbiology research that is entwined with chemistry and computational sciences.

Beyond my own research career, I have provided national-level leadership through service on committees that have had a substantive impact on the trajectories of key fields in science and technology. For instance, I co-chaired a committee that prepared the 2007 National Research Council report, "*The New Science of Metagenomics,*" which provided a roadmap for this new and rapidly growing domain of research. The recommendations in that report fostered NIH's Human Microbiome Project, which has transformed our understanding of the role of microorganisms in human health and chronic disease, a field poised to offer a new era of microbial treatments for disease and personalized medicine. In addition to my direct experience in a wide array of research fields, the breadth of my research program has necessitated collaboration with scientists in many other fields, including statistics, chemistry, and internal medicine. These diverse research thrusts have required funding from numerous Federal and private institutions, preparing me to be an effective interface with leaders of agencies with a multitude of missions.

Research and Innovation in STEM Education. My research in STEM education has similarly spanned the realms of basic and applied science. My education research group has particularly aimed at understanding the importance of human diversity in undergraduate education and the impact of new educational interventions on diverse students. I developed an approach known as "scientific teaching" that relies on validated teaching practices and uses student diversity to improve classroom learning for all students. Scientific teaching has contributed to the transformation of science education in colleges and universities nationwide through the National Academies Summer Institutes on Undergraduate Education and programs in scientific teaching for future faculty. I co-founded the Summer Institutes in 2003 in an effort to train university faculty in effective teaching methods. My team led the expansion of the original Summer Institute to eight Institutes across regions of the United States that have each affected participants directly, as well as faculty subsequently trained by the participants. My programs at the University of Wisconsin-Madison and Yale University that are directed at training future faculty in classroom teaching and mentoring, have served as a model for other programs, creating a nationwide cohort of young scientists ready to change university teaching. Together, the programs for both current and future faculty have trained more than 1,000 in effective teaching methods. My books, *"Entering Mentoring"* and *"Scientific Teaching,"* have influenced thousands of other educators. In 2011, President Obama presented me with the Presidential Award on Science, Mathematics, and Engineering Mentoring in recognition of my national work on education transformation.

STEM education must be a core element of any U.S. strategy for continued global leadership and is a central responsibility within OSTP's Science Division. My experience in improving science education nationally—both in terms of my evidence-based understanding of pedagogical theory and my practical experience launching on-the-ground initiatives—has prepared me to offer leadership in the strategic formulation and implementation of national initiatives. And my teaching experience will provide me with the skills to communicate with scientists and non-scientists about technical and education issues.

Public Engagement with Science. I believe that science must be accessible and compelling to non-scientists to ensure the robustness of our democracy and the furtherance of the American spirit of innovation. My 27 years of teaching biology to non-science majors prepared me to teach science to the public. My greatest delight in teaching has always been captivating people, especially those who think they have no interest in science, with the extraordinary impact and power of scientific investigation. I learned to strip away jargon to expose nuggets of biology that have broad appeal because of either their intrinsic beauty or their implications for the human condition. At OSTP, I would look forward to communicating about science with broad audiences to advance understanding of science and strengthen the public's voice in science policy.

As a professor at a land grant university, I had ample opportunity to engage with the citizens of Wisconsin on science issues for 27 years. Through that outreach, I learned firsthand of the public's concerns about new advances in science and technology as well as the importance of public dialogue in a pluralistic society. As department chair at the University of Wisconsin-Madison, I designed an outreach program with an open venue for the public to discuss microbiology, and a museum with living and interactive displays that illustrated the interactions between microorganisms and animals. Since moving to Yale University, I have developed a program to train graduate students in the sciences to communicate with the public effectively, using leading science journalists to coach and advise the graduate students.

If confirmed to serve at OSTP, I could aid the government in serving the public with sound science policy. The fiber of the partnership between government and citizen depends on public understanding of science and science policy in order to make informed decisions in an increasingly technological world. My past experience in public communication would contribute to effective dissemination of information about science and science policy.

Leadership Style. My approach to leadership is informed by my study of education. Copious research shows that students learn little without active engagement in their learning. Likewise, I have found that to be most creative and productive in the workplace, people need active engagement in decisions and strategic action. I therefore developed an engaged approach to leading groups (and a process known as "speed-visioning") that I have applied and refined to lead my research laboratory, committees, a department, and a national movement in science education. My contributions in microbiology and education research have relied upon constructing groups with hand-picked talent and personalities that attain a level of creativity that far exceeds the abilities of the individuals within the groups. In leading a department, I entered an established organization and built a similar ethos of innovation and excellence. The skills of selecting talent and inspiring excellence from teams will be useful in leading staff, galvanizing support for initiatives, building coalitions, and negotiating compromises, all of which are key roles for the OSTP Associate Director for Science.

19. What do you believe are your responsibilities, if confirmed, to ensure that the department/agency has proper management and accounting controls, and what experience do you have in managing a large organization?

OSTP has a sophisticated staff that shares the responsibility of providing counsel and problem solving to assist the President. It is important that the staff share a common vision and maintain a collaborative operating style for maximum effectiveness. It will be essential for me to affirm this vision, if confirmed, and to meet regularly with key personnel to ensure that effective management and accounting principles are being applied.

My research lab has typically contained 15 to 20 postdoctoral scientists, graduate students, undergraduate students, and occasionally, high school students. Running a lab entails obtaining funding for each member, providing a balance of guidance and independence, and fostering individual growth that strengthens the group through teamwork and cooperation. Achieving maximum productivity requires managing interpersonal challenges, individual responses to failure and success, and the tumultuous landscape of funding in a rapidly changing field of science.

At the University of Wisconsin, I served as chair of the Department of Bacteriology, a unit of 180 people with an annual budget of $6,000,000. The Department's mission includes research, education, and public outreach, and is supported by funding from a variety of public and private sources, each governed by different legal parameters and institutional policies. I corrected irregular fiscal practices; maintained a balanced budget; and used flexibility, good will, and creative fundraising to sustain and expand the operation in an era of significant budget reductions.

20. What do you believe to be the top three challenges facing the department/agency, and why?

1. The overriding challenge—the task that, if handled skillfully, will have the greatest long-term impact on the future of the country—is to ensure that the national science budget is deployed strategically. In an era of tight resources, it is particularly challenging to achieve a balance between sustaining successful ongoing programs and initiating new areas of research. The very nature of science is dynamic, a blend of investigations designed to achieve greater depth in existing areas and those seeking to expand the frontiers of knowledge. The constant change in scientific knowledge requires that science leaders in government exhibit vision, flexibility, and commitment to supporting at appropriate levels those fields of investigation with the greatest potential to serve the American people in the short-, medium-, and long-terms.
2. The second challenge is to make science education more effective. In both K–12 and higher education, there have never been greater opportunities to take advantage of new knowledge about how people learn as well as modern educational technology. The challenge is to enhance current science education through myriad routes of influence. Building on my previous work, which has focused on the agency of individual educators and educational institutions, the OSTP position provides a platform and an opportunity to apply modern lessons about science education on a national scale and for the full breadth of players in the STEM education community. I served on the committees (and co-chaired one) that authored the 2011 and 2012 reports on STEM education prepared by the President's Council of Advisors on Science and Technology (PCAST). I am deeply knowledgeable about the necessary changes, and about how to implement those changes programmatically.
3. The third challenge is communication among scientists, policy makers, and the public. People will not support priorities they don't understand. The scientific community will chafe at the difficult choices made by government if they are not cognizant of the basis for the choices. Likewise, the public will not understand why resources are invested in science without understanding its potential impact on our collective future. I believe that OSTP, in close collaboration with our colleagues in Congress, can play a catalytic role in enhancing this dialogue through the Federal agencies and private sector with which OSTP interacts.

B. POTENTIAL CONFLICTS OF INTEREST

1. Describe all financial arrangements, deferred compensation agreements, and other continuing dealings with business associates, clients, or customers. Please include information related to retirement accounts.

If confirmed, I will take an unpaid leave of absence from my position as the Howard Hughes Medical Institute Professor and Frederick Phineas Rose Professor at Yale University.

I will maintain my Yale pension plan, my Accumulated Sick Leave Escrow Account, and my Wisconsin Retirement System Pension Account through the University of Wisconsin-Madison.

2. Do you have any commitments or agreements, formal or informal, to maintain employment, affiliation, or practice with any business, association or other organization during your appointment? If so, please explain.

If confirmed, I will take an unpaid leave of absence from my position as the Howard Hughes Medical Institute Professor and Frederick Phineas Rose Professor at Yale University.

3. Indicate any investments, obligations, liabilities, or other relationships which could involve potential conflicts of interest in the position to which you have been nominated.

In connection with the nomination process, I have consulted with the Office of Government Ethics and OSTP's designated agency ethics official to identify potential conflicts of interest. Any potential conflicts of interest will be resolved in accordance with the terms of an ethics agreement that I have entered into with OSTP's designated agency ethics official and that has been provided to this Committee. I am not aware of any other potential conflicts of interest.

4. Describe any business relationship, dealing, or financial transaction which you have had during the last ten years, whether for yourself, on behalf of a client, or acting as an agent, that could in any way constitute or result in a possible conflict of interest in the position to which you have been nominated.

In connection with the nomination process, I have consulted with the Office of Government Ethics and OSTP's designated agency ethics official to identify potential conflicts of interest. Any potential conflicts of interest will be resolved in accordance with the terms of an ethics agreement that I have entered into with OSTP's designated agency ethics official and that has been provided to this Committee. I am not aware of any other potential conflicts of interest.

5. Describe any activity during the past ten years in which you have been engaged for the purpose of directly or indirectly influencing the passage, defeat, or modification of any legislation or affecting the administration and execution of law or public policy.

I have engaged in no such activity.

6. Explain how you will resolve any potential conflict of interest, including any that may be disclosed by your responses to the above items.

In connection with the nomination process, I have consulted with the Office of Government Ethics and OSTP's designated agency ethics official to identify potential conflicts of interest. Any potential conflicts of interest will be resolved in accordance with the terms of an ethics agreement that I have entered into with OSTP's designated agency ethics official and that has been provided to this Committee. I am not aware of any other potential conflicts of interest.

C. LEGAL MATTERS

1. Have you ever been disciplined or cited for a breach of ethics by, or been the subject of a complaint to any court, administrative agency, professional association, disciplinary committee, or other professional group? If so, please explain. No.

2. Have you ever been investigated, arrested, charged, or held by any Federal, State, or other law enforcement authority of any Federal, State, county, or municipal entity, other than for a minor traffic offense? If so, please explain. No.

3. Have you or any business of which you are or were an officer ever been involved as a party in an administrative agency proceeding or civil litigation? If so, please explain. No.

4. Have you ever been convicted (including pleas of guilty or *nolo contendere*) of any criminal violation other than a minor traffic offense? If so, please explain. No.

5. Have you ever been accused, formally or informally, of sexual harassment or discrimination on the basis of sex, race, religion, or any other basis? If so, please explain. No.

6. Please advise the Committee of any additional information, favorable or unfavorable, which you feel should be disclosed in connection with your nomination. None to my knowledge.

D. RELATIONSHIP WITH COMMITTEE

1. Will you ensure that your department/agency complies with deadlines for information set by congressional committees? Yes.

2. Will you ensure that your department/agency does whatever it can to protect congressional witnesses and whistle blowers from reprisal for their testimony and disclosures? Yes.

3. Will you cooperate in providing the Committee with requested witnesses, including technical experts and career employees, with firsthand knowledge of matters of interest to the Committee? Yes.

4. Are you willing to appear and testify before any duly constituted committee of the Congress on such occasions as you may be reasonably requested to do so? Yes.

RESUMÉ OF JO HANDELSMAN

Howard Hughes Medical Institute Professor and Frederick Phineas Rose Professor
Yale University
Department of Molecular, Cellular & Developmental Biology
219 Prospect Street, 904 Kline Biology Tower
New Haven, CT 06511

Education

1979–1984, Ph.D., University of Wisconsin-Madison, Molecular Biology

1976–1979, B.S., Cornell University, Agronomy

Positions Held

2012—National Academies Summer Institutes on Science Education, Executive Committee, Co-chair

2012—Series Editor, “Entering Mentoring”

2010—Professor, Department of Molecular, Cellular and Developmental Biology, Yale University

2010—Director, The Center for Scientific Teaching at Yale

2007–2009—Professor and Chair, Department of Bacteriology, University of Wisconsin

2007–2011—Editor-in-Chief, *DNA and Cell Biology*

2004–2012—Co-Director (with Bill Wood, University of Colorado), National Academies Summer Institute on Undergraduate Education in Biology

2003—Series Editor, “Controversies in Science and Technology”

2002—Howard Hughes Medical Institute Professor

2002–2010—Director, Wisconsin Program for Scientific Teaching

2005–2008—Editor, *Applied and Environmental Microbiology*

2005–2008—Editor, *Cell Biology Education*

2001–2007—Co-Director (and Co-Founder with Molly Carnes), Women in Science and Engineering Leadership Institute (WISELI)

1997–1999—Director, Institute for Pest and Pathogen Management, University of Wisconsin

1995–2007—Professor, Department of Plant Pathology, University of Wisconsin

1991–1995—Associate Professor, Department of Plant Pathology, University of Wisconsin

1985–1991—Assistant Professor, Department of Plant Pathology, University of Wisconsin

1984–1985—Postdoctoral Fellow, Department of Plant Pathology, University of Wisconsin

Senator NELSON. Thank you, Dr. Handelsman.

Dr. Sullivan.

STATEMENT OF DR. KATHRYN SULLIVAN, NOMINEE TO BE UNDER SECRETARY OF COMMERCE FOR OCEANS AND ATMOSPHERE AND ADMINISTRATOR OF THE NATIONAL OCEANOGRAPHIC AND ATMOSPHERIC ADMINISTRATION

Dr. SULLIVAN. Thank you, Mr. Chairman, Ranking Member Thune, and members of the Committee. I am very honored to come before you today as President Obama's nominee for Under Secretary of Commerce for Oceans and Atmosphere and Administrator of the National Oceanic and Atmospheric Administration. And Mr. Chairman, with your permission, I will switch to acronyms now as well.

Let me take this opportunity to thank Secretary Pritzker and Acting Deputy Secretary Gallagher for their support of my nomination and to acknowledge the family and friends who join me here today. I am very grateful for their support. Also with me in spirit today are my late father and mother, who nurtured in me my curiosity about the natural world, my sense of adventure and exploration, and a commitment to helping others understand our planet.

I joined NASA in 1978 as a member of the first class of shuttle astronauts, also the first group that included women. No words can describe the awe of looking down on our blue planet from space. It is a singular and spectacular experience and one I treasure. It was also a profoundly formative experience and one that has led me to NOAA.

I first joined NOAA immediately upon my return from my third shuttle flight as a nominee of George H. W. Bush and subsequently President Clinton's appointee to the role of NOAA Chief Scientist. I am drawn to the Agency because our mission is to observe, forecast, and interpret complex earth systems for the benefit of our people and communities. While NOAA is not alone in conducting earth science, our commitment to provide this information to the American public as useful services sets us apart. We are the nation's source of the critical and timely environmental intelligence that is essential to ensuring our communities are safe, resilient, sustainable, and prosperous.

My time at NASA taught me a lot about myself, about organizations, and earth systems, but it was at NOAA that I learned how to bring this knowledge to bear to solve real problems for communities across our country. These experiences have left me with three lessons that will guide me as NOAA Administrator if I am confirmed.

First, I have learned that it is not enough just to understand our planet. We must apply this understanding to solving the real problems that our citizens, businesses and leaders face every single day. And that's exactly what NOAA does. We transform scientific data into actionable environmental intelligence that can help us live wisely and well on this dynamic planet of ours.

We all know this as the weather forecast that protects lives and livelihoods from storms, like Hurricane Sandy, or that alert Midwest communities months in advance to coming floods. But it is also the nautical charts and navigation data that allow cargo to move safely through our ports and harbors, the climate data behind plant hardiness zones, the harmful algae bloom forecasts that allow local communities to keep beachgoers and shellfish farms safe, the solar storm forecast that allow utilities to protect our electric grid, and the stock assessments that set sustainable levels of catch for our Nation's fisheries. All of that is NOAA.

So, too, are the observational platforms, our satellites, radars, buoys, ships, and aircraft that create and sustain the flows of data which underpin our ability to provide this critical environmental intelligence. And all of this, of course, is only possible thanks to the many thousand highly talented employees, contractors, and academic partners who serve NOAA with exceptional dedication and passion.

Second, my service in the shuttle program, 18 years in the Navy Reserve and my experience at NOAA have all taught me a great deal about the importance of operational rigor. The breadth, depth, and critical nature of NOAA's operational missions are central to our strength and our value to the country as an agency.

Third, an effective organization needs strong leadership and management from the top. I have significant management experience with organizations of various scales in the nonprofit, corporate, and Federal arenas. If confirmed, I will apply these years of experience to providing the direction and support that NOAA employees need to deliver on our mission.

I am immensely proud to be nominated for this position because I believe, at its core, NOAA is government at its best. If given the opportunity, I will work every day with the dedicated public servants at NOAA, with our key stakeholders, including you, the members of this Committee, and with the communities we serve to provide the critical environmental intelligence that our citizens, businesses, and coastal communities and public leaders need. You can count on me to focus on the management and leadership questions that matter most to meeting this mission.

Thank you, again, for the opportunity to testify and for your consideration of my nomination. I look forward to your questions.

[The prepared statement and biographical information of Dr. Sullivan follow:]

PREPARED STATEMENT OF KATHRYN D. SULLIVAN, NOMINEE FOR UNDER SECRETARY OF COMMERCE FOR OCEANS AND ATMOSPHERE, UNITED STATES DEPARTMENT OF COMMERCE

Thank you Mr. Chairman and members of the Committee. I am honored to come before you today as President Obama's nominee for Under Secretary of Commerce for Oceans and Atmosphere and Administrator of the National Oceanic and Atmospheric Administration. I would also like to thank Secretary Pritzker and Acting Deputy Secretary Gallagher for their support of my nomination.

I am happy to have the support of my friends and family that are here with me today. Also with me in spirit are my late father and mother, who nurtured in me my curiosity of the natural world, my sense of adventure and exploration and my commitment to helping others understand our planet.

When I was six my family moved to California, and the open spaces of the San Fernando Valley became my playground. Our family's flying and fishing trips kindled in me an interest in the air we flew through, the streams we fished in and the ground we stood upon. My deep connection with the oceans came later—during a required natural sciences course, at the University of California, Santa Cruz. My plan, until that fateful semester, was to use a knack for foreign languages to explore the world. What I didn't know at the time was that that marine biology class would lead me down a path of exploration—first as an oceanographer, then as an astronaut, and finally to NOAA. My teachers were not just doing science for science's sake. They knew our planet like it was their own backyard, and they were using their understanding to solve real world problems. They were explorers and problem solvers all in one. And I knew instantly what I wanted to do with my career.

I joined NASA in 1978 as part of the eighth class of shuttle astronauts—the first to include women. No words can describe the awe of looking down on our blue planet from space. It is a singular experience, and one I treasure. It is also a key experience that led me here to NOAA.

I first joined NOAA immediately upon my return from my third Shuttle flight, as a nominee of George H.W. Bush and, subsequently, as an appointee of President Clinton's to the role of Chief Scientist. I was drawn to NOAA because our mission is to observe, forecast, and interpret complex earth systems for the benefit of our people and communities. While NOAA is not alone in conducting earth science, our commitment to provide that information to the American public as useful "services" sets us apart. NOAA is the Nation's source of the critical and timely environmental intelligence that is essential to ensure our communities are safe, resilient, sustainable, and prosperous.

My time at NASA taught me a lot about myself, organizations and earth systems, but it was at NOAA that I learned how to bring that knowledge to bear to solve real problems our citizens, businesses and leaders face each day. These experiences have left me with three lessons that will guide me as NOAA Administrator, if confirmed.

First, I've learned that it's not enough to just understand our planet. We must bring that knowledge to bear to solve the real problems our citizens, businesses, and leaders face every single day. That is exactly what NOAA does. We transform scientific data into actionable environmental intelligence that can help us live wisely and well on this dynamic planet. You know this as the weather forecasts that protect lives and livelihoods from storms like Hurricane Sandy, or that alert Midwest communities months in advance to coming floods. But it's also the nautical charts and navigation data that allow cargo to move safely through our ports; the climate data behind plant hardiness zones; the harmful algae bloom forecasts that allow local communities to keep beach goers and shellfish farms safe; the solar storm forecasts that allow utilities to safeguard our electric grid; and the stock assessments that set sustainable levels of catch in our Nation's fisheries. All of that is NOAA. So too are the observational platforms—our satellites, radars, buoys, ships and aircraft—that create and sustain the flows of data which underpin our ability to provide this critical environmental intelligence. If confirmed, a central focus of mine will be to insure the scientific integrity and quality of this intelligence are sustained and to engage closely with stakeholders to guarantee we're delivering the most needed services in effective ways.

NOAA is an agency that has staff working in each and every state with constant operations that demand efficiency and sound guidance. This brings me to my second point. My service in the Shuttle Program, 18 years in the U.S. Navy Reserve, and experience at NOAA have taught me a great deal about the importance of operational rigor. The breadth, depth, and critical nature of NOAA's operational missions are central to our strength and value as an agency. We are at sea with our fishermen and on the docks when they come home, ensuring our fisheries are sustained today and into the future. Our weather forecasters are on the front lines with first-responders and emergency managers when extreme weather strikes, providing lifesaving forecasts and warnings. Our Office of Response and Restoration provides spill trajectories for oil and chemical spills, and our satellite operators never take their eye off the ball, ensuring we have the real-time data we need, 24 hours a day, seven days a week, 365 days a year. Members of the NOAA Corps clear ports of debris and ensure safe navigation after major storms and deploy buoys essential for detecting tsunamis before they reach shore. Our team at the National Integrated Drought Information System works with water managers and farmers to help them adjust to drought conditions. The people of NOAA rise to the challenge every day. I understand how to lead operational teams, and I will ensure that NOAA operations are efficient and at-the-ready if confirmed as NOAA Administrator.

Third, an effective organization needs strong leadership and management from the top. I have significant management experience with organizations of various scales in the non-profit, corporate and Federal Government sectors. For nearly a decade, I led Ohio's Center of Science & Industry (COSI) through a major transformation that included the design and construction of a new facility and total redesign of all operating systems and business processes. Most aspects of the transformation were achieved by making the most of internal expertise mobilized in project teams that I formed, supervised, and integrated. Creative and effective management is needed throughout the Federal Government, and I firmly believe I will bring that to NOAA. I have also served as an independent corporate director on the boards of several Fortune 500 companies. This service allowed me to study closely a variety of large-enterprise business process and management models, and provided me with practical insights that continue to inform my own management practices. If confirmed, I will apply my years of management experience to provide the support that NOAA employees need to deliver on our mission. I believe in, and will ensure that NOAA has strong, transparent and forward-looking business practices. And I will make it a priority to make the investments and changes needed to ensure NOAA is a well-managed agency.

I am immensely proud to be nominated for this position because I believe, at its core, NOAA is government at its best. If given the opportunity, I will work every day with the dedicated public servants at NOAA, our key stakeholders—including you, members of this committee—and the communities we serve to provide the critical environmental intelligence our citizens, businesses, coastal communities and public leaders need to address the questions and challenges they face every single day. You can count on me to focus on the management and leadership questions that matter to meeting this mission.

Thank you again for the opportunity to testify and for your consideration of my nomination. I would be happy to respond to any questions you may have.

A. BIOGRAPHICAL INFORMATION

1. Name (Include any former names or nicknames used): Kathryn Dwyer Sullivan (Kathy or Kathryn D.)

2. Position to which nominated: Under Secretary of Commerce for Oceans and Atmosphere and NOAA Administrator.

3. Date of Nomination: August 1, 2013.

4. Address (List current place of residence and office addresses):

Residence: Information not released to the public.

Office: Department of Commerce, 1401 Constitution Ave NW, Washington, DC 20230.

5. Date and Place of Birth: October 3, 1951; Paterson, NJ.

6. Provide the name, position, and place of employment for your spouse (if married) and the names and ages of your children (including stepchildren and children by a previous marriage). None.

7. List all college and graduate degrees. Provide year and school attended.

1969–1973 S.S., University of California, Santa Cruz
1973–1978 PhD, Dalhousie University (Halifax, Nova Scotia, Canada)

8. List all post-undergraduate employment, and highlight all management-level jobs held and any non-managerial jobs that relate to the position for which you are nominated.

(a) Graduate Fellow, Dalhousie University (1973–1975) and National Research Council Canada (1975–1978), Halifax, Nova Scotia.
Relevant work: Marine geology and geophysics research expeditions.

(b) Mission Specialist Astronaut, NASA Johnson Space Center (1978–1993), Houston, TX.
Relevant work: Mission Manager, WB–57F high-altitude research aircraft program (1979–1981); Mission Lead & Co-Investigator, Shuttle Imaging Radar-B flight experiment, STS–41G (1983–1984); Mission Specialist, Hubble Space Telescope deployment mission, STS–31 (198501990); Payload Commander, ATLAS–1 Atmospheric Sciences Spacelab mission, STS–45 (1990–1992).

(c) Chief Scientist, NOAA (1993–1996), Washington, D.C.

(d) Oceanography Officer, U.S. Navy Reserve (1988–2007)
Relevant work: Tactical sensor operational performance predictions, CTF–66 (1988–1989); Executive Officer and Commanding Officer, NORA 1570 (meteorological and oceanographic services training unit), NAS Dallas (1989–1993); Environmental sensor and models research portfolio assessment, SPAWAR 0466/ Naval Research Laboratory 1993–1996).

(e) President & CEO (4/1996–12/2005) and Science Adviser (1/2006–11/2006), COSI (Center of Science & Industry), Columbus OH
Relevant work: Executive leadership and supervision; full profit and loss financial responsibility; strategic planning; annual operating plans and budgets; communications and marketing strategies; stakeholder relationships; design and funding of science education exhibitions and programs.

(f) Director, Battelle Center for Mathematics and Science Education Policy, John Glenn School of Public Affairs, Ohio State University (2006–2011).
Relevance: Conceived of and directed original research in educational policy analysis and methods. Developed and taught graduate level coursework in national science and technology policy.

(g) Corporation Member, Woods Hole Oceanographic Institution (1997–2011).
Relevance: This non-governing affiliation with WHOI allowed me to remain current with ocean sciences, especially ocean observing vehicles and technologies.

(h) National Science Board (2004–2011)
Relevance: Programmatic and budgetary matters coming before the board allowed me to maintain currency with environmental observation, monitoring and research programs and technology developments in fields ranging from atmospheric and ocean sciences to high-performance computing.

(i) Assistant Secretary of Commerce for Environmental Observation and Prediction and Deputy Administrator and Chief Scientist, NOAA (2011 to present).
Relevant work: Agency-wide strategy, planning, budget formulation and direction pertinent to observation, modeling and prediction enterprises; interagency policy and program coordination; international partnerships and formal representation; Congressional testimony and relationships; stakeholder and constituent relationship management; public communications.

9. Attach a copy of your resume. A copy is attached.

10. List any advisory, consultative, honorary, or other part-time service or positions with Federal, State, or local governments, other than those listed above, within the last five years.

Governor's Institute on Creativity and Innovation in Education: Advisory panel on program design (2008–2009)

11. List all positions held as an officer, director, trustee, partner, proprietor, agent, representative, or consultant of any corporation, company, firm, partnership, or other business, enterprise, educational, or other institution within the last five years.

K.D. Sullivan Enterprises LLC (Sole proprietor, 2005 to present)

N951AG LLC (Sole proprietor, 2006 to present)

American Electric Power (Independent director, 1997–2011)

Noblis (Trustee, 2001–2011)

Waterfire Columbus (Trustee, 2005–2011)

ris DC/Bullard Street (passive restaurant investment, 2008 to present)

Pizzuti Companies (science and technology advisor, Exploration Park project, Kennedy Space Center, FL; 2007–2011)

American Association for the Advancement of Science (Trustee, 2004–2008)

12. Please list each membership you have had during the past ten years or currently hold with any civic, social, charitable, educational, political, professional, fraternal, benevolent or religious organization, private club, or other membership organization. Include dates of membership and any positions you have held with any organization. Please note whether any such club or organization restricts membership on the basis of sex, race, color, religion, national origin, age, or handicap.

Association U.S. Navy (was Naval Reserve Association) (1988 to present)

Worthington Hills Country Club (2008 to present)

Friends of Long Marine Laboratory (2009–2011)

The Lakes Country Club (1999 to present)

Ohio State University Faculty Club (2006–2011)

*Girl Scouts USA (1983 to present; gender restriction)

American Association for the Advancement of Science (1981 to present; Board member 2004–2008)

Woods Hole Oceanographic Inst. Corporation (1997–2011)

The Association of the U.S. Navy (1988 to present)

The Smithsonian Institution (as long as I can remember)

COSI Columbus (Member, 1996–2008; President and CEO 1996–2005; Science Advisor 2005–2006)

Explorers Club of New York (1981 to present)

*Society of Woman Geographers (1981 to present; gender restriction)
*Women in Aviation International (2008 to present; gender restriction)
American Institute of Aeronautics & Astronautics (1981 to present)
The Planetary Society (1982 to present; Board member 2000–2003)
Sea Space Symposium (1988 to present)
Association of Space Explorers (1991 to present)
*International Women's Forum (1993 to present; gender restriction)
University of California Santa Cruz alumni association (1996 to present)
Sigma Xi (1989 to present)
The Ravines at Worthingridge Condo Assoc. (1996 to present)
Association of Science & Technology Centers (1996–2005; board term 1997–2001)
Giant Screen Theater Association (1996–2005; board term 1999–2003)

13. Have you ever been a candidate for and/or held a public office (elected, non elected, or appointed)? If so, indicate whether any campaign has any outstanding debt, the amount, and whether you are personally liable for that debt.

Nominated for Chief Scientist, NOAA by President Bush in April 1992 and then by President Clinton in February 1993. Appointed by President Clinton in March 1993 (1993–1996).

Assistant Secretary of Commerce for Environmental Observation and Prediction and Deputy Administrator, NOAA (2011 to present). Nominated and appointed by President Obama.

14. ltemize all political contributions to any individual, campaign organization, political party, political action committee, or similar entity of $500 or more for the past ten years. Also list all offices you have held with, and services rendered to, a state or national political party or election committee during the same period.

Paula L. Brooks for Representative campaign 2010: $500
Ralph Regula for Congress Committee 2002: $1,000

15. List all scholarships, fellowships, honorary degrees, honorary society memberships, military medals, and any other special recognition for outstanding service or achievements.

2013: Honorary Doctorate, Willamette University
2011: McGovern Science & Society Award, Sigma Xi (Honorarium)
2010: Women Aviator's Hall of Fame
2010: Women in Aviation Pioneer Hall of Fame
2008: Women Divers Hall of Fame
2007: Explorers Medal, Explorers Club of New York
2005: Aerospace Legends Hall of Fame, Aviation Week & Space Technology magazine
2004: United States Astronauts Hall of Fame
2004: Adler Planetarium Leader in Space Science
2003: National Science Board Public Service Award
2002: Honorary degree, Kent State University
2002: Juliette Award for Women of Distinction, Girl Scouts USA
2002: Ohio Women's Hall of Fame
2001: Ohio Veteran's Hall of Fame
2001: YWCA Women of Achievement
1997: Lone Sailor Award, U.S. Navy Memorial Foundation
1992: Honorary degree, Stevens Institute of Technology
1992: NASA Medal for Outstanding Leadership
1992: Vic Prather Award
1991: Honorary degree, State University of New York, Utica
1988: Honorary degree, Ohio Dominican College
1988: NASA Exceptional Service Medal
1987: Ten Outstanding Young Americans Award, U.S. Jaycees
1987: Ten Outstanding Young People of the World, Jaycees International

1985: Honorary degree, Dalhousie University

1985: National Air and Space Museum Trophy

16. Please list each book, article, column, or publication you have authored, individually or with others. Also list any speeches that you have given on topics relevant to the position for which you have been nominated. Do not attach copies of these publications unless otherwise instructed.

I have done my best to identify books, articles, columns, publications or relevant speeches, including a thorough review of personal files and searches of publically available electronic databases. Despite my searches, there may be other materials I have been unable to identify, find, or remember. I have located the following:

Publications

Generative Leadership: Shaping New Futures for Today's Schools (2008), K. Klimek, E. Ritzenhein & K. D. Sullivan. Corwin Press.

Women Leading the Way: Reflections on Life and Leadership (2005), The Academy for Leadership & Governance, Columbus Ohio.

America's Living Oceans: Charting a Course for Sea Change (2003), Pew Oceans Commission final report.

A Glimpse of Home (2002), Time Magazine Special Report on the Environment (August 26 edition, A4–AS).

Technology and the City's Future (1997), Mayoral Task Force Report (Co Chair and lead author).

The Atmospheric Laboratory for Applications and Science-1: A Shuttle Mission (1992), with M.R. Torr; EOS, Transactions of the American Geophysical Union.

Geography Reaches New Heights: An Astronaut's View of Earth (1991), Update, National Geographic Society, Washington, D.C.

Earth Observations During Space Shuttle Flight STS–31: The Earth from 600 Kilometers (1991), with Evans et al.; Geocarto International 6(3), 99–112.

Pioneering the Space Frontier (1986), Report of the National Commission on Space; Bantam Books, NY.

Geology of the Venus Lowlands: Guinevere and Sedna Planitia (1984), with J.W. Head; Lunar and Planetary Science Conference Proceedings, Houston, Texas.

Elysium Planitia, Mars: Regional Geology, Volcanology and Evidence for Volcano/Ground-Ice Interactions (1984), with P. Mouginis-Mark; Earth, Moon and Planets 30, 149–173.

The Newfoundland Basin: Ocean-Continent Boundary and Mesozoic Seafloor Spreading History (1983); Earth and Planetary Science Letters 62, 321–339.

Radar andInfrared Remote Sensing of Geothermal Features at Pilgrim Springs, Alaska (1982), with K.G. Dean, R.B. Forbes, D.L. Turner and F.D. Eaton; Remote Sensing of Environment 12, 391–405.

The Potential for Manned Earth Observations in the Space Shuttle Era (1979), International Union of Geodesy and Geophysics, 17th General Assembly, Canberra, Australia.

The Structure and Composition of the Linear Volcanic Chains of the Western North Atlantic (1979), with R. Houghton; Hawaii Symposium onIntra-Plate Volcanism, Hilo, Hawaii.

Geologist in Space (1979), in: GEOS, Department of Energy, Mines and Resources, Ottawa, Canada, 5–7.

On the Nature of the Crust in the Vicinity of the Southeast Newfoundland Ridge (1978), with C.E. Keen; Canadian Journal of Earth Sciences 15(9), 1462–1471.

Mesozoic Evolution of the Newfoundland Basin (1977), with C.E. Keen and B.R. Hall; Earth and Planetary Science Letters, 37, 307–320.

Newfoundland Seamounts: Petrology and Geochemistry (1977), with C.E. Keen; Geological Association of Canada, Special Paper 16, 461–476.

Deep-Drill Investigations of the Oceanic Crust in the North Atlantic (1975), with F. Aumento; in: Geodynamics of Iceland & the North Atlantic, NATO Advanced Study Institute, Reykjavik, 83–104.

Speeches

Acting NOAA Administrator

March 5, 2013: Sea Grant Association

March 21, 2013: World Meteorological Organization World Weather Watch Day "50th Anniversary of the WMO's World Weather Watch"

April 4, 2013, 2013 AMS Washington Forum: Panel: "Federal Agency Leadership"

April 8, 2013: NOAA Satellite Conference

April 30, 2013: G–8 International Conference on Open Data for Agriculture

May 7, 2013: DOC Bronze Medal and NOAA Career Awards Ceremony

May 7, 2013: Hydrographic Review Services Panel (HSRP)

March 8, 2013: USS Monitor Memorial Service

May 12, 2013: Willamette University Commencement "Don't Leave the Motto at the School Gates"

May 18, 2013: 95th NOAA Corps Dining Out Keynote

May 23, 2013: 2013 Hurricane Outlook Press Conference

May 23, 2013: White House Women's Leadership Summit on Climate and Energy: *Panel "Climate Science and Energy Action"*

May 28, 2013: NOAA Office of Education Student Scholarship Orientation

May 30, 2013: 2013 Hurricane Outlook POTUS Brief

May 31, 2013: Basic Officer Training Class 121 Graduation Keynote

June 4, 2013: Space Weather Enterprise Forum

June 4, 2013: Capitol Hill Ocean Week (CHOW) Keynote: "Healthy Oceans and Coasts for a Resilient America"

June 27, 2013: Bureau of Safety and Environmental Enforcement (BSEE) Hurricane Forum

July 16, 2013: 5th Symposium on the Impacts of an Ice-Diminishing Arctic on Naval and Maritime Operations: "Critical Environmental Intelligence as a Force-Multiplier for Arctic Stewardship"

July 20, 2013: Ocean Exploration 2020

Assistant Secretary for Environmental Observation and Prediction

March 29, 2011: Goddard "Critical Environmental Intelligence, Protecting America's Future"

July 18, 2011: Meeting of the State Climatologists

September 16, 2011: President's Council of Advisors on Science and Technology

November 11, 2011: OOS Summit "A New Decade of the Integrated Ocean Observing System"

January 10, 2012: Opening Remarks for the 2013 AMS International Session

February 7, 2012: NOAA 2012 Black History Month Program

February 21, 2012: National Water Center Groundbreaking

March 28, 2012: MIT Global Change Forum

April 14, 2012: NASA Education Keynote

April 18, 2012: Bryant University Research and Engagement Day "This Adventure Called Life"

April 19, 2012: City College of New York—NOAA Cooperative Remote Sensing Science and Technology Center (CREST) Day "NOAA: Protecting America's Future Through Critical Environmental Intelligence"

April 19, 2012: City College of New York Earth Day

June 7, 2012: Marine Operations Center—Atlantic Change of Command

June 7, 2012: Blue Planet Forum "Environmental Intelligence for Coastal Communities"

June 8, 2012: NOAA Ship *Ferdinand* Hassier Commissioning

June 22, 2012: NOAA Corps Basic Officer Training Class 121 Graduation Keynote

October 18, 2012: American Pilots' Association 2012 Biennial Meeting

January 10, 2013: American Meteorological Society Annual Meeting "Vision and Strategies for a Weather Ready Nation"

February 11, 2013: Reinsurance Association of America CAT Modeling Conference "NOAA's Role in Disaster Resilience—Space Weather"

February 25, 2013: National Estuarine Research Reserve Association Board Meeting

17. Please identify each instance in which you have testified orally or in writing before Congress in a governmental or non-governmental capacity and specify the date and subject matter of each testimony.

June 26, 2013—As NOAA's Acting Under Secretary of Commerce for Oceans and Atmosphere and NOAA Administrator before the House Committee on Science, Space, and Technology, Subcommittee on Environment (Chair, Representative Christ Stewart, R UT–2) during a hearing titled "Restoring U.S. Leadership in Weather Forecasting, Part 2."

April 23, 2013—As NOAA's Acting Under Secretary of Commerce for Oceans and Atmosphere and NOAA Administrator before the Senate Committee on Commerce, Science, and Transportation, Subcommittee on Oceans, Atmosphere, Fisheries, and Coast Guard (Chair, Senator Mark Begich, D–AK) during a hearing titled, "Oversight of the President's Fiscal Year 2014 Budget Request for Coast Guard and NOAA."

April 18, 2013—As NOAA's Acting Under Secretary of Commerce for Oceans and Atmosphere and NOAA Administrator before the House Committee on Natural Resources, Subcommittee on Fisheries, Wildlife, Oceans, and Insular Affairs (Chair, Representative John Fleming, R LA–4) during an oversight hearing titled, "Spending for the National Oceanic and Atmospheric Administration, the Council on Environmental Quality, the Office of Insular Affairs, the U.S. Fish and Wildlife Service and the President's Fiscal Year 2014 Budget Request for these Agencies."

September 12, 2012—As NOAA's Assistant Secretary for Environmental Observation and Prediction before the House Committee on Science, Space, and Technology, Subcommittee on Investigations and Oversight (Chair, Representative Paul Broun, R GA–10) during a hearing titled, "Mismanagement of Funds at the National Weather Service and the Impact on the Future of Weather Forecasting".

June 27, 2012—As NOAA's Assistant Secretary for Environmental Observation and Prediction before the House Committee on Science, Space, and Technology, Subcommittee on Investigations and Oversight (Chair, Representative Paul Broun, R GA–10) and the Subcommittee on Energy and Environment (Chair, Representative Andy Harris, R MD–1) during a hearing titled, "Continuing Oversight of the Nation's Weather Satellite Programs—An Update on JPSS and GOES–R."

July 28, 2011—As NOAA's Assistant Secretary of Commerce for Environmental Observation and Prediction before the Senate Committee on Appropriations, Subcommittee on Financial Services and General Government (Chair, Senator Richard Durbin, D–IL) during a hearing titled, "Federal Disaster Assistance—"Are We Weather-Ready?"

March 10, 2011—As nominee for NOAA Assistant Secretary of Commerce before the Senate Commerce Committee Assistant Secretary for Environmental Observations and Predictions for NOAA. She was confirmed by the Senate on May 11, 2011.

May 24, 1993—As nominee for NOAA Chief Scientist before the Senate Commerce Committee. Dr. Sullivan was confirmed by the Senate in June, 1993.

18. Given the current mission, major programs, and major operational objectives of the department/agency to which you have been nominated, what in your background or employment experience do you believe affirmatively qualifies you for appointment to the position for which you have been nominated, and why do you wish to serve in that position?

Countless aspects of my background and prior employment qualify me for this position including my previous time at NOAA as Assistant Secretary for Environmental Observation and Prediction and Chief Scientist. Broadly stated, these include my academic preparation in the earth sciences, my operational experience in scientific field expeditions, spaceflight operations and operational environmental forecasting for the U.S. Navy, my prior Federal service with both NASA and NOAA and the scientific and technical currency I've been able to retain through my National Science Board service. Iwish to serve in this capacity, because Ibelieve Ican contribute substantively, if confirmed, to the success of one of the Nation's most trusted agencies providing the Nation and the world with trustworthy, reliable atmospheric science, remarkable environmental service, and outstanding stewardship of the Nation's oceans and coasts.

19. What do you believe are your responsibilities, if confirmed, to ensure that the department/agency has proper management and accounting controls, and what experience do you have in managing a large organization?

Within the domains overseen by this position, I believe I bear responsibility to ensure that all programs and operations are planned, budgeted and executed following approved policies and procedures, and that proper program management and accounting controls are in place and functioning as designed.

I have significant management experience with organizations of various scales in the non-profit, corporate and Federal Government sectors. From 1996–2005, I led Ohio's Center of Science & Industry (COSI) through a major transformation that included the design and construction of a 300,000 square foot, $125 million new facility and total re-design of all operating systems and business processes. We brought in external expertise for the architectural design and construction phases, but all other aspects of the transformation were achieved with internal expertise mobilized in project teams that I formed, supervised and integrated. From 1997–2011, I served as an independent corporate director on the boards of several Fortune 500 companies. This service allowed me to study a variety of large-enterprise business process and management models at close hand and provided me many practical insights that now inform my own management practices. Notably, my chairmanship of the nuclear oversight committee of one company and the human resources committee of another (not Fortune 500) involved hands-on development of new processes in employee performance evaluation, compensation analysis and complex technical operations. In the Federal arena, as NOAA Chief Scientist from 1993–1996 I oversaw the agency's roughly $500 million research, development and technology portfolio and conceived and led the first-ever review of laboratory programs across the entire agency. Since returning to NOAA as Deputy Administrator in 2011, I have overseen and driven management changes in the National Environmental Satellite Data and Information Service, Marine Operations and National Weather Service.

20. What do you believe to be the top three challenges facing the department/agency, and why?

> 1. NOAA's critical environmental intelligence is the most valuable asset the agency provides to the Nation—yet the observational platforms, which are essential to collecting these data, are aging. Opportunities exist to innovate and reimagine these systems for the future—saving significant investments through new public-private partnerships and new technologies. If confirmed, ensuring NOAA can continue to provide this critical environmental intelligence will be a top priority.
>
> 2. The demand for NOAA's services is increasing—meeting this demand will require innovation on a number of fronts within NOAA. One particular area of concern is our ability to transition research advancements into operations. This year, NOAA has made significant advancement on this front for weather forecasting thanks to the Sandy Supplemental, but additional work is needed in this area, which I would seek to continue, if confirmed.
>
> 3. Balancing the multiple missions of NOAA is a challenge, especially when short-term, yet significant acquisition budgets for satellites impact other mission functions. It is a priority of mine, if confirmed, to find and maintain balance across NOAA programs.

B. POTENTIAL CONFLICTS OF INTEREST

1. Describe all financial arrangements, deferred compensation agreements, and other continuing dealings with business associates, clients, or customers. Please include information related to retirement accounts.

AEP deferred compensation balances: two unfunded memo accounts record the amounts due to me since I left the board in 2011. The value of one memo account tracks securities in the JP Morgan 401k program that is open to all AEP employees. The value of the other memo account tracks the AEP stock price. I elected to have these amounts paid to me in five annual installments, three of which have been paid to date the remaining two will depend on AEP's value on the stock market at that time.

2. Do you have any commitments or agreements, formal or informal, to maintain employment, affiliation, or practice with any business, association or other organization during your appointment? If so, please explain. No.

3. Indicate any investments, obligations, liabilities, or other relationships which could involve potential conflicts of interest in the position to which you have been nominated.

In connection with the nomination process, I have consulted with the Office of Government Ethics and the Department of Commerce's designated agency ethics official to identify potential conflicts of interest. Any potential conflicts of interest will be resolved in accordance with the terms of an ethics agreement that I have entered into with the Department of Commerce's designated agency ethics official and that has been provided to this Committee. I am not aware of any other potential conflicts of interest.

4. Describe any business relationship, dealing, or financial transaction which you have had during the last ten years, whether for yourself, on behalf of a client, or acting as an agent, that could in any way constitute or result in a possible conflict of interest in the position to which you have been nominated.

In connection with the nomination process, I have consulted with the Office of Government Ethics and the Department of Commerce's designated agency ethics official to identify potential conflicts of interest. Any potential conflicts of interest will be resolved in accordance with the terms of an ethics agreement that I have entered into with the Department of Commerce's designated agency ethics official and that has been provided to this Committee. I am not aware of any other potential conflicts of interest.

5. Describe any activity during the past ten years in which you have been engaged for the purpose of directly or indirectly influencing the passage, defeat, or modification of any legislation or affecting the administration and execution of law or public policy.

I have engaged in no such activity.

6. Explain how you will resolve any potential conflict of interest, including any that may be disclosed by your responses to the above items.

In connection with the nomination process, I have consulted with the Office of Government Ethics and the Department of Commerce's designated agency ethics official to identify potential conflicts of interest. Any potential conflicts of interest will be resolved in accordance with the terms of an ethics agreement that I have entered into with the Department of Commerce's designated agency ethics official and that has been provided to this Committee. I am not aware of any other potential conflicts of interest.

C. LEGAL MATTERS

1. Have you ever been disciplined or cited for a breach of ethics by, or been the subject of a complaint to any court, administrative agency, professional association, disciplinary committee, or other professional group? If so, please explain. No.

2. Have you ever been investigated, arrested, charged, or held by any Federal, State, or other law enforcement authority of any Federal, State, county, or municipal entity, other than for a minor traffic offense? If so, please explain. No.

3. Have you or any business of which you are or were an officer ever been involved as a party in an administrative agency proceeding or civil litigation? If so, please explain.

From 1997–2011, I served as an independent director at American Electric Power (AEP). During my tenure, I may have been named in lawsuits against AEP as a party in my official capacity, but am unaware of any findings of wrongdoing on my behalf.

4. Have you ever been convicted (including pleas of guilty or *nolo contendere)* of any criminal violation other than a minor traffic offense? If so, please explain. No.

5. Have you ever been accused, formally or informally, of sexual harassment or discrimination on the basis of sex, race, religion, or any other basis? If so, please explain.

NOAA employee, Sam Williamson, named me as an additional party in a discrimination action he brought against then-NOAA Administrator D. James Baker in the 1995–1997 timeframe. Iwas interviewed by DOC Counsel's office personnel on several occasions, but never disposed or subpoenaed. I was subsequently informed that the matter was closed, but have no knowledge of the final disposition.

6. Please advise the Committee of any additional information, favorable or unfavorable, which you feel should be disclosed in connection with your nomination. None to my knowledge.

D. RELATIONSHIP WITH COMMITTEE

1. Will you ensure that your department/agency complies with deadlines for information set by congressional committees? Yes.

2. Will you ensure that your department/agency does whatever it can to protect congressional witnesses and whistle blowers from reprisal for their testimony and disclosures? Yes.

3. Will you cooperate in providing the Committee with requested witnesses, including technical experts and career employees, with firsthand knowledge of matters of interest to the Committee? Yes.

4. Are you willing to appear and testify before any duly constituted committee of the Congress on such occasions as you may be reasonably requested to do so? Yes.

Senator NELSON. We are fortunate to have people of your knowledge and experience and your willingness to serve our country, so thank you.

I am going to defer my questions for the members of the Committee and I would turn to Senator Thune.

Senator THUNE. Thank you, Mr. Chairman.

Dr. Simon, as I indicated, I am proud of the work that is done at the South Dakota School of Mines and Technology. Mining education and research have generally been in decline since the Bureau of Mines and its programs were abolished in the mid-1990s. This decline has reached a crisis stage, as many faculty and researchers are at or near retirement age and demand is increasing for a new generation of workers and technologies.

The National Academy has recently released a report entitled, “Emerging Workforce Trends in the U.S. Energy and Mining Industries: A Call to Action” which concluded that there is a pressing need to attract young people into advanced engineering fields and to energy and mining careers.

And so my question is, if you are confirmed, would you look at ways that the Federal Government could focus on revitalizing our mining research enterprise?

Dr. SIMON. Senator Thune, thanks so much for that question and I entirely agree with you. I think that our mining industry in this country is one of our important industries. This country has important mineral resources that are key to key industries, like the chemical processing industry, to advance energy technologies.

I also agree with you personally that the decision to reorganize the Bureau of Mines out of existence a number of years ago had some really deleterious effects on our ability to train and equip people in these important fields. And so, if I’m confirmed, I certainly—I haven’t read this particular latest academy report, but if I am confirmed, I certainly would be happy to work with you and with other people on what might be constructively done to make sure that we continue a pipeline of trained professionals who can work in this important industry.

Senator THUNE. Thanks. I wanted to ask another question that deals with more of—it’s more of a South Dakota issue, but it is also an issue that is affecting sort of the mountains all over the country and that has to do with the Mountain Pine Beetle epidemic that has destroyed over a third of the Black Hills National Forest and it has affected over 100 percent of the trees in the Black Hill Elk Wilderness Area, which is an area within the Black Hills. And that infestation has only continued to grow and it is being experienced in other states and other forests around the country as well.

The question has to do with how could forest R&D help find ways to help manage and slow the spread of outbreaks in forests like those in my state and improve overall forest health?

Dr. SIMON. Well, thanks for that question, too, Senator. And as you mentioned, when I met with the staff and they asked me what sorts of issues, what sort of rose to the top of my personal priority list of things that I thought was important for the government to work on, clearly the whole issue of research and development to support forest health and to improve forest health throughout the United States is high on my list and is precisely, actually, motivated by the very example you talked about.

When I worked for Senator Jeff Bingaman in New Mexico, we had Bark Beetle infestations in New Mexico and they spread up through Colorado. Now there is, you know, sort of all up and down the West, we have just this critical problem. And partly because of, you know, change in climatic conditions. You know, there was a time in which when we had cold winters, you know, and you'd kill off the Bark Beetle larva and eggs. And now they're surviving and we're having a terrible problem.

And I do think that, you know, looking at the general condition of our forests, you know, there is, I think, sort of a wide range of things that need to be done. There are probably some improved management practices on the ground. I think we've learned a lot about forest management over the last 50 years. I think we've stopped some practices which were probably well-intentioned at the time, like some forms of fire suppression and certain places that, you know, now looking back, probably wasn't such a smart thing to be doing.

But I do think that there has to be a good fundamental research agenda there that will give us some new tools to look at these issues, to improve the health of forests generally, and then go after some of these specific questions. And again, if I'm confirmed, that will certainly be something that I'm looking to try to make a constructive input to.

Senator THUNE. OK, thank you. It's a very important issue to my state and many others.

Dr. Handelsman, I understand that you have closely studied the vulnerability of the U.S. and global food supply. Could you elaborate on this potential problem and discuss how agricultural research and development might contribute to greater food security?

Dr. HANDELSMAN. Thank you for that question, Senator Thune. As you know, that's an area that I'm quite committed to.

The food security of today is less than we've ever experienced in the modern area. And that's partly due to the pressures of population growth, but also the changing weather and other conditions that affect our ability to raise crops and animals. And so I think we need a very robust agricultural research agenda to help control some of the losses that we experience.

About 50 percent of our crops are lost to pests and pathogens, so largely insects and rodents, as well as bacteria, fungi and viruses. If we just controlled all of those losses, we would double the food supply. So one very simple, but important, investment is in the pests and pathogens and new means for control of them that threaten our crops and food supply.

Senator THUNE. Thank you, Mr. Chairman. My time has expired. I have some questions I could submit for the record to Dr. Sullivan as well. I know you will cover the NOAA issues well in your questions, too, so thank you.

Senator NELSON. Thank you. And of course the record will be left open for members of the Committee to submit questions.

Senator Heinrich.

STATEMENT OF HON. MARTIN HEINRICH, U.S. SENATOR FROM NEW MEXICO

Senator HEINRICH. Thank you, Chairman. And I want to thank our panel. It's a pleasure to hear from a panel with so much scientific background. And it's not every day that we do that here on the Hill, so.

And in particular, I want to thank you all for your commitment to the scientific method and the STEM education. I've had the pleasure of knowing Bob for quite some time, from back when I was on the Albuquerque City Council, before I was even a Member of Congress, and I'm very much looking forward to supporting your nomination. I would concur with my colleague that the issue of forest health, in particular the impact that Bark Beetles are having all up and down the West, as we are having warmer and warmer winters, is a huge issue for the entire Intermountain West.

I probably want to—I've had enough chance to work with Bob that I just want to thank you for your continued service and jump to a question for Dr. Handelsman. And you raised an issue which, fortuitously, I was actually talking to some folks about this morning, which is the lack of investment, adequate investment, in antibiotic research, which I think is a critical problem.

The other side of that equation that I think we also need to take a very science-based approach to as to do with just how much we are using antibiotics prophylactically within our food system, particularly with livestock today. I wanted to ask you your thoughts on the role that overuse, or prophylactic use, may be playing in infectious resistance to antibiotics.

Dr. HANDELSMAN. Thank you for that question, Senator. Obviously, a topic close to my personal experience. The use in agriculture of antibiotics goes way back and, despite its very extensive use, we still don't understand the mechanisms underlying the growth promotion or, as you say, the prophylactic use of antibiotics to promote the food supply. So there are some cases where we use antibiotics to control disease in both trees and animals, but a vast amount of the antibiotic use is prophylactic or growth-promoting.

One place that we could make an investment is in understanding the basis for that. And if we understood the growth promotion effects, particularly in poultry and pork, I think we could offer the growers better solutions and alternatives and greatly reduce the amount of antibiotic that we introduce into the environment.

Senator HEINRICH. Do you see a relationship between the use of those antibiotics and the development of more aggressive infectious strains?

Dr. HANDELSMAN. The resistance that bacteria in human health develop is partly due to selection, the differential survival of resistant strains, and some of that selection pressure comes from hospitals and medical use, and we have good evidence that there is overuse there that could be controlled. But some of that is exposure in the environment to antibiotics and, in particular, in agricultural settings, so I think there's no question that reduction of antibiotic use in agriculture would help. Other countries that have banned the use of antibiotics in prophylactic situations with animals have seen a drop in antibiotic resistance in clinical settings.

Senator HEINRICH. Dr. Sullivan, I want to put a little bit of a shout-out for the National Weather Service today, as we've been experiencing some amazing rainfall amounts in the Intermountain West. Most of the news has been on Colorado and, given the scale of what they faced, rightfully so. We have had similar, although not quite as acute, events in New Mexico from the same storm and found the information from the National Weather Service to be absolutely critical, although sometimes somewhat hard to get to.

And I wanted to ask you your thoughts on the use of—the expanded use of mobile apps to be able to get to scientific data that no other weather service or other agencies may have. In many cases, in a state like New Mexico, that is highly rural, you can't necessarily get to in any other way. And often times a mobile phone app is the best connection for somebody in an area that may be experiencing a very out of characteristic rainfall, to be able to get to important information that allows them to be able to manage an emergency situation. I'm just curious if you've given thought to the expanded use of those kinds of tools.

Dr. SULLIVAN. Thank you, Senator, it's a very important question. And let me add my concern and sympathies to the events that your citizens are facing in New Mexico. This truly has been an utterly unprecedented event and it is quite devastating.

You've put your finger on a very important point which we have begun to realize with increasing clarity in just the last few years as the number and intensity of extreme weather events increase. It's a cornerstone principle under our Weather-Ready Nation initiative, which essentially says to us at NOAA we need to be technically excellent at the forecast. But the real purpose of the forecast is to make sure that it connects in a timely fashion and in a way that signals timely action to the people who need the information.

In this area of social media and increasing proliferation of mobile devices, that is clearly an avenue that we need to understand better, work with our partners in the private sector component of the weather enterprise, and do all we can to use to maximum advantage.

Senator NELSON. Thank you, Senator.

Senator Cantwell.

STATEMENT OF HON. MARIA CANTWELL, U.S. SENATOR FROM WASHINGTON

Senator CANTWELL. Thank you, Mr. Chairman, and thank you for having this hearing. It's good to see all of the witnesses here and I, too, want to add my thanks to Dr. Simon for his leadership in so many areas. So I look forward to having you in this new capacity, but like my colleague, unfortunately I have more questions for Dr. Sullivan than I do for Mr. Simon or Ms. Handelsman.

But to follow up on that Weather-Ready question, obviously, you know, this is a subject that we care a lot about in the Pacific Northwest, as we had to implement a new Doppler system. So are you going to support maintaining weather buoys and survey assist—you know, stock assessments? Using all of that information and planning it out, to a more robust system than we have today and making that transparent for the public?

Dr. SULLIVAN. Senator, I think it is absolutely critical that we sustain a robust observing enterprise to power all of NOAA's missions, as I commented in my oral statement. The observational data absolutely are the underpinning of what we do.

We have made some strides in the past 2 years to set a better, clearer, and more transparent foundation under our requirements and be sure those are flowing sensibly and well into well-designed portfolios of observing systems. Continuing to do that and drive that forward will certainly be a priority of mine, if confirmed.

Senator CANTWELL. So do we have the supercomputing power to do that?

Dr. SULLIVAN. We are on track, thanks in part to efforts you help lead and we very much appreciate, and to funds that were provided by the Congress in the Sandy Supplemental bill. We have been able to move forward, just in these last few months, on our operational weather forecasting supercomputers. They are today already twice—have already today twice the capacity that they had when we last visited with you out on the West Coast.

We are on track to be on par with the best in the world in supercomputing capacity and that is an absolutely essential ingredient to sustain the quality of forecast services that we all wish to have.

Senator CANTWELL. Well, thank you. I can't emphasize enough how important this is and so we just need to tell the American people if we have a resource shortage here or whether we don't. But clearly with the amount of storms that we've had and the impact and the loss of life, having NOAA have the greatest facilities, not hearing from the Europeans that Sandy is going to have the impact that it has, but hearing from NOAA that Sandy is going to have the impact that it had, and having people prepare for that, to me, is a critical mission for the agency, so I hope you'll keep us posted on resources.

I wanted to ask you, the *Seattle Times* is running all of this, the past few days, stories on ocean acidification, front page, not—I mean, it's the entire front page, if you will. And so I wanted to get your sense of where ocean acidification will be as a priority for you at NOAA.

Dr. SULLIVAN. As you know very well, Senator, ocean acidification is sort of one of the creeping threats of global change and the increasing concentration of carbon dioxide in the atmosphere. It's a very difficult problem. It's going to be a very difficult problem to monitor and provide foresight about to coastal communities.

We have made some progress in that regard in your region, as I know you are aware, with our ocean buoys and our Harmful Algae Bloom Warning System. That has paid some real dividends to West Coast shellfish farmers and helping them close off water intakes and prevent slurping in patches of more acidic water that could damage the young oysters that they are trying to seed in their pens. It's a large-scale, truly global problem, as you know, systemic in affecting the earth's systems, but it is also patchy and has very patchy local consequences.

We will certainly continue to work forward with you, if I am confirmed, to make sure that we can put in place the right source of observing and forecasting and monitoring systems to help us be as alert and aware and provide as much foresight as possible on this condition.

Senator CANTWELL. So you will develop sensors in critical areas, you will continue to do research, you will continue to deploy adaptive breeding programs, recommend management?

Dr. SULLIVAN. Within the resources available to us, Senator, we certainly will do that. All of those are components of our current ocean acidification program, as you know.

Senator CANTWELL. OK. Within resources, that's an interesting way of phrasing it. I guess I would say we had to come up with the resources to get that initial program that you just said pays dividends. And without it, I think, you know, probably three or four or five generations of families of shellfish growers, you know, would have been wiped out. And we grow something like 25 percent of the shellfish in one bay in our state, so this is a very serious issue. So I hope we can not predicate it based on resources, but on the urgency for this industry and for the resources to have the information.

Let me turn to one related aspect of that, because my time is almost out, and that is NOAA Research Fleet and the fact that NOAA needs to have additional vessels. Do you support moving ahead on replacing these aging vessels and making sure that NOAA has a fleet of research information that is necessary to do its job and responsibility?

Dr. SULLIVAN. I do support that, Senator. It is quite imperative. Every analysis that has been done over the last years of the Federal oceanographic fleet, including NOAA's assets, show a very precipitous decline within the next ten or so years if we don't begin to reinvest in these very critical capital assets. We've been doing the planning and preparation within NOAA to move on those fronts and look forward to working with you to achieve that.

Senator CANTWELL. So that will be one of your priorities?

Dr. SULLIVAN. Yes, ma'am.

Senator CANTWELL. OK, thank you. I see my time is up, Mr. Chairman. Thank you.

Senator NELSON. Thank you, Senator.

Senator Ayotte.

STATEMENT OF HON. KELLY AYOTTE, U.S. SENATOR FROM NEW HAMPSHIRE

Senator AYOTTE. Thank you, Chairman. I want to thank everyone for being here. This is obviously very important nominations and positions.

And Dr. Sullivan, I wanted to talk to you about the plight of our fisherman in New Hampshire. You and I had a chance to meet and talk about this personally, but we've got a situation where, last year, there was a disaster declaration for New England groundfish. This year, the cod quotas were cut 78 percent.

I can't think of a business, and I've raised this several times in this committee, that can go with a 78 percent cut on their quotas. And you, when we met, talked about having full confidence in Administrator John Bullard's ability to keep these small fishing businesses surviving and that he would use every tool in his toolbox to assist our fisherman.

However, when he testified before this Committee in July, I told him how troubled I was that NOAA had refused to allow interim measures for the 2013 fishing year for Gulf of Maine cod and Gulf of Maine haddock. In my view, interim measures were a legitimate tool in the toolbox that was not used.

And we have a situation right now, just looking at the numbers, the number of acting fishing boats in New Hampshire has been decimated from 26 in 2010, to 14 this year, and this past summer only four were fishing. They are leaving the fishing—they are leaving the fishery at an alarming rate. As you and I talked about when we met, this is a noble, noble group of individuals who, many of them, have fished for many generations.

And so I want to ask you, when we think about in the fact that we did not grant, that NOAA did not grant the interim measures, what action does NOAA plan to take to sustain our fishing industry in New Hampshire beyond 2013?

Dr. SULLIVAN. Thank you, Senator. This is a very, very important issue and I very keenly appreciate both the iconic stature of these communities and of this industry in the New England region and in your state in particular, and the fact that, when we make these fisheries decisions, we are making real decisions that affect real people and real livelihoods. I am keenly aware of and sensitive to that and I promise you I will remain so.

We will use every tool that we have at our disposal legally and otherwise. And as I said to you in our private meeting, I am confident that John is turning over every stone, working creatively and collaboratively, with fisherman, shore-side processors as well, in the region to do all that we can to help them through this very difficult time. Weathering the cuts that were required by Magnuson is definitely a big challenge that we recognize fully.

Senator AYOTTE. Well, as you know, as we talked about when we met, our Attorney General, a position that I once held, and our Governor have now sued over these regulations and I fully support them. Because I support the lawsuit, because I've seen the devastation to our fishermen.

And one of the concerns that I have is, it seems to me that NOAA is not balancing both standards. Because if you look at the National Standards, you have National Standard 1 that focuses on conservation of our fish stocks, but you also have National Standard 8, which focuses on making sure that we are taking into account the importance of the fishery, the fishing communities, and providing for the sustained participation of such communities.

And so I would ask you, right now I don't see how you can cut someone's quota 78 percent, not grant interim measures, how that is really a fair balance of those two Standards. So in your position that you are nominated for, how do you plan to balance those standards so that we aren't putting fishermen and women out of business?

Dr. SULLIVAN. Senator, we don't have a magic figure in mind for the perfect balance point between those standards. If confirmed, I will certainly follow what guidance the court may issue in that matter that your state and Massachusetts have tendered and maintain an open and transparent and, I hope, collaborative and productive relationship with you and the members of this Committee. And increasingly, a trusting and open relationship with fishermen in your region to be sure that, together, we are finding the right balance points on those mandatory standards.

Senator AYOTTE. Will you come to New Hampshire and meet with our fishermen and women? Because I would hope that you would come meet these people who have worked incredibly hard, who are being put out of business, so that you can put a face to the individuals and families that are being affected right now by the Catch Shares rule and the way that it is being implemented.

Dr. SULLIVAN. I have met with a small number of New Hampshire fishermen when I was up in the state a few months ago to visit the University of New Hampshire and our hydrographics center. Administrator Bullard has spoken with me about possibly joining him to meet folks in some of the communities as well. I would look forward to that opportunity.

Senator AYOTTE. Good. We would love to have you there.

And then finally, one of the issues that you and I talked about is the—having good research about what the stocks actually are and how will you plan to improve the science behind measuring fish stocks so that we can make sure that we are getting accurate measurements when we think about these quotas and what they do to the livelihood of our fishermen and women.

Dr. SULLIVAN. That's a problem we remain diligent about and need to continue to press forward on, Senator. It is partly a question of resources, the demand for virtually all of NOAA's services across the board are continuing to increase and I know you appreciate the dilemma that that poses in these difficult fiscal times.

We are working increasingly with cooperative research with fishermen in the area, making sure that we have their best available collective knowledge about the state of the fishery as well. And of course we don't rely just on NOAA research, but on any and all of the best published, peer-reviewed scientific literature to guide our decisions.

Senator AYOTTE. But I would also say that obviously with the disaster declaration that we hope will be supported for our fishermen, it would be better to allow them to fish. So that would be a fiscally responsible decision, too.

So I thank you. I look forward to the follow up on this and I hope that we can find a resolution that allows out noble fishermen and women to continue fishing in New Hampshire and throughout New England.

Senator NELSON. Senator, that problem is not only in New England, but all across the coastal United States. And of course in the cutback of funding, it has made it critical, in order to get the funds to do the research, to more concurrently address what is the actual number of the fishery.

Now, help is on the way. And it is as a result of the RESTORE Act, of which 2.5 percent is set aside in the RESTORE Act and I will quote from that Act. And the legislative intent is to, "Carry out research, observation, and monitoring to support the long-term sustainability of the ecosystem, the fish stocks, the fish habitat, and the recreational, commercial, and charter fishing industry."

Specifically, that legislative intent was put in by me with regard to the Gulf of Mexico, where we've had a substantial problem as well. But once the Judge decides in Federal Court in New Orleans what is going to be the penalty assessed against BP, and assuming that the appeals run fairly quickly, then that money flows, 80 percent of that money flows through the RESTORE Act itself. And 2.5 percent of that—let's say the fund can go anywhere from $5 to $20 billion dollars. So if you just take a midpoint of a $10 billion fine, as you can see, that's starting to be some real money for this purpose.

And as you have very cogently and very pointedly brought up the problem with your fish stocks, it is this Senator's hope that, with this infusion, they can do the assessments of those fisheries in a timely fashion, instead of what has been the case in the past where, under the Magnuson-Stevens Act, they are dealing with 6 year old data. And that's my hope. So thank you——

Senator AYOTTE. Well——

Senator NELSON.—for bringing that up.

Senator AYOTTE. Thank you, Chairman. And I'm very glad that we are going to allocate those resources for better research. And the worry that I have, and I know you share, is that those resources which are important for having current data on our stocks, it could be too late for our fishermen.

So I think that, in light of the fact that we are going to put additional resources to getting better research toward this, we need to also, in the interim, make sure that we aren't putting them all out of business while we are trying to figure this out.

So I look forward to working with you on that and I know that you care deeply about that, too, so thank you.

Senator NELSON. Senator Markey.

STATEMENT OF HON. EDWARD MARKEY, U.S. SENATOR FROM MASSACHUSETTS

Senator MARKEY. Thank you, Mr. Chairman, very much. Dr. Sullivan, a year ago the Commerce Department took the unprecedented step in declaring a prospective fishing disaster for the New England ground fish fishery. That disaster has become a reality.

At the start of this year, House Republicans blocked funding for disaster aid for the New England fishery and others around the country also had disaster declarations. I am continuing to work with my colleagues across New England to find money for our struggling fishermen. We have also asked the administration to work across agencies to mobilize resources that could help our fishermen and the communities that depend upon them.

Will you commit to working within Commerce and with other agencies to find ways to help our fishermen, even as we try to overcome opposition in Congress, to disaster fishing?

Dr. SULLIVAN. Thank you for that question, Senator. We very much appreciate the work that you and others have done in this chamber to provide some funding for the declared disasters that exist around the country.

I will certainly commit to working with you to find any and all solutions that might be brought to bear on helping fishermen get through these tough times.

Senator MARKEY. Thank you. Now, New England is also home to one of the great fishery rebuilding success stories. The Massachusetts Sea Scallop fishery has gone from being closed in the 1990s to one of the top valued fisheries in the United States today. That achievement came about from collaboration between fishermen and scientist to improve management of the fishery.

What is your vision for cooperative research to help meet NOAA's mission?

Dr. SULLIVAN. The scallop fishery is a great example, Senator. It was a very cooperative, productive relationship between NOAA and the Fisheries Management Council and the fishermen. It reflects tremendous ingenuity on the part of the industry and it reflects very collaborative efforts, both on the research side and, as you know, on the marketing side.

Once upon a time, not all that long ago, scallops went for something under 50 cents a pound, 38 cents or so, I believe. No one wanted them. And look at the value they have now in the marketplace and how much we all appreciate them on our restaurant plates. That is one of the stories, in his own past, that I know motivates John Bullard in his work in the Northeast. To continue to improve relationships with the fishermen, the communities, the shore-side processors in the New England region, work collaboratively on research out on the sea, and work together very collaboratively to advance new markets for fish stocks.

Senator MARKEY. And finally, Dr. Sullivan, our nation's weather is becoming more extreme, at great cost in damages and sadly in lives lost as well. Scientists are very clear that climate change is contributing to many of these extreme events.

Could you explain how NOAA's climate work contributes to NOAA's weather mission and to enhancing public safety and keeping the Nation prepared for weather events?

Dr. SULLIVAN. I really appreciate that question very much, Senator Markey. It's a very tight interplay between the climate work that NOAA does and our general mission and responsibility to provide foresight to the American people about environmental conditions.

You know, this planet doesn't respect the academic boundaries we build in universities between oceanographers or atmospheric scientists or chemists, nor does it respect the time scales that we find pertinent and convenient in our daily lives. It's an integrated system of systems and that's a reality that informs how we go about studying and working with the climate at NOAA.

Just to cite one example, if we did not have the understanding that we have today of the El Niño southern oscillation phenomenon, if we did not have the capability we have today to provide outlooks months in advance throughout the state of the El Nino, that would affect and that would undermine forecasting capability we have for longer range outlooks on hurricanes and severe storms through all of our seasons. The longer term informs the shorter term and vice versa.

Senator MARKEY. Thank you, Dr. Sullivan. Dr. Simon, the Department of Energy has proposed a complete shutdown and elimination of funding for MIT's Fusion Energy Facility. That will cause a loss of jobs, loss of graduate students, loss of expertise and experimental ability in this important field. The Department has said that it needs to shut down its National User Facility at MIT in order to pay for the United States' contribution to an international fusion project, but the MIT facility is the only one in the world that can accomplish some key fusion science goals and the international project is struggling to meet its construction timetable and budget.

Before taking irrevocable steps to shut down one of the nation's preeminent fusion facilities, I think we should develop a roadmap for the country's fusion future so that we can make decisions that best serve this scientific field. If you are confirmed, will you work to ensure that such a roadmap is developed with full input from the research community?

Dr. SIMON. Senator, thank you very much for that question. As someone who has had the opportunity to work on the difficult issues of, you know, fitting scientific programs within, you know, given budgets, I know how important it is to have sort of a clear idea of where you're going and who you need to bring along with you along the way, which is what a roadmap provides.

And I certainly, if I were confirmed, I certainly would be very interested in working with you and with others to make sure that, going forward in the fusion program, which has a lot of promise but also involves very complicated and high cost facilities, that are very difficult to build, frankly, and manage, that we have that kind of roadmap in place and that we work cooperatively with people in the academic community, people in the industry, as well as people in the Department of Energy who are trying to manage this complicated set of issues.

Senator MARKEY. Thank you. And finally, Mr. Chairman, thank you.

In 2002, Congress enacted a law that I authored to provide potassium iodide to public facilities such as schools and hospitals, as well as to the people who live within 20 miles of a nuclear power plant. This medication is a cheap and effective way to prevent radioactive iodine from causing thyroid cancer or other disorders. That was the principle impact after the Chernobyl accident.

But to be most effective, it must be taken within a few hours of exposure to the radiation produced during a nuclear reactor meltdown. That is why health experts, including the American Thyroid Association, recommend that it be pre-distributed to individual households. That way, people evacuating during a radiological emergency could take their dose as they leave their homes, instead of waiting an uncertain amount of time for an evacuation to be completed.

The Bush administration's Department of Health and Human Services started to implement my law, but then the head of the Bush administration's Office of Science and Technology Policy ordered implementation to stop and actually said that it would be more effective if people just evacuated.

Although I have tried, on many occasions, to ask this administration to reverse that decision and implement the law, it has not yet done so. The Pilgrim Nuclear Generating Facility is in Plymouth, about 45 miles from Boston. If there was a meltdown, not only would you have residents from the vicinity of the reactor evacuating the area, you would also have people from Cape Cod doing so also. Now, it can take 8 hours to get from Cape Cod to Boston in a normal traffic jam many days. Can you imagine how long it would take people from all around the Pilgrim reactor and the Cape if everyone was trying to escape, riding past the actual meltdown?

It is absurd not to provide people with this medication that they can take as they sit in traffic, as they try to evacuate. It is absurd in the case of Fukushima, when evacuations were ordered hours after significant radiation releases began, to withhold this drug from people who might need it. And it is absurd that this administration to continue to refuse to follow the law and continue to rely on a disingenuous misinterpretation of the law that was adopted by the previous administration to waive its full implementation.

I have met with Dr. Holdren and his staff on this matter and corresponded with his office and other administration officials on several occasions. In March of this year, I joined with public health and nuclear safety experts to send a letter to Dr. Holdren with a detailed analysis of why the Bush administration's decision was flawed. I ask unanimous consent that that be included in the record.

And I thank you, Mr. Chairman, for giving me this opportunity.

[The information referred to follows:]

HOUSE OF REPRESENTATIVES
Washington, DC, March 28, 2013

Hon. JOHN P. HOLDREN,
Director, White House Office of Science & Technology Policy,
Executive Office of the President,
Washington, DC.

Dear Dr. Holdren:

We write to urge you to overturn the decision of your predecessor that effectively blocked the implementation of a 2002 law requiring the distribution of potassium iodide to public facilities such as schools and hospitals as well as to the people who live within 20 miles of nuclear power plants in order to protect them against the effects of a radioactive iodine release. We believe that a failure on your part to do so would be tantamount to a rejection of both sound science and the opportunity to learn important lessons from the 2011 nuclear meltdowns in Japan.

Potassium iodide, known by its chemical symbol KI, protects the thyroid gland by flooding it with stable iodine so that the gland cannot take up the cancer-causing radioactive form that can be released during melt-downs of nuclear reactors.[1] If an earthquake, terrorist attack, or accident caused a radiation release in the United States, one of the greatest risks to health comes from radioactive forms of the chemical element iodine. Children are the most vulnerable because their thyroid glands concentrate more iodine on a per unit mass basis than adults and are more sensitive to radiation because of their rapidly dividing cells.

Timing of KI distribution is critical as the drug is most effective if used within 3–4 hours of exposure.[2] According to the Food and Drug Administration (FDA), inhalation of radioactive iodine is a significant contributor to exposure and is of particular concern for those residing in the immediate area of a nuclear accident or otherwise directly exposed to the radioactive plume. This means that it is critical to distribute KI to residents and local authorities *before* a radiation release happens, rather than scrambling to try to do it afterwards as happened during the 1979 Three Mile Island accident, or at Fukushima when its distribution was only ordered five days after the nuclear accident commenced.[3]

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[1] *http://www.birdflumanual.com/resources/Self_Defense/files/Guidance%20for%20use%20of%20KI%20for%20nuclear%20emergency%20USG.pdf*

[2] *http://www.fda.gov/Drugs/EmergencyPreparedness/BioterrorismandDrugPreparedness/ucm072265.htm*

Section 127 of the Bioterrorism Preparedness and Response Act of 2002 directed the President to establish a program to make KI available free to State and local governments for distribution to residents living within 20 miles of a nuclear power plant. Previously, distribution was limited to just those within 10 miles, and only to states that requested it from the Nuclear Regulatory Commission (NRC).

The Congress' choice of a minimum 20-mile KI distribution radius was driven by its recognition that radiological exposure during a nuclear emergency could exceed the "intervention level", set by the NRC to be 5 rem to a child's thyroid gland, at distances greater than 10 miles from the event. Despite the 2002 law and a multitude of studies and other endorsements related to the use of KI,[4] your predecessor, the late Dr. John Marburger, in a January 22, 2008[5] memorandum (hereafter referred to as the Marburger memo), chose to invoke a novel and erroneous interpretation of Section 127(f) of the law, previously rejected by the Department of Health and Human Services, to prevent KI distribution. Section 127(f) was included in the law to allow halting of KI distribution only if superior radiation protection was achieved in the future with a newly-developed drug or method. However, instead of citing a new prophylaxis, Dr. Marburger declared that evacuation and removal of contaminated foodstuffs were "more effective . . . than the administration of KI." He used as a basis for his decision an analysis prepared at his request by the Federal Radiological Preparedness Coordinating Committee (hereafter referred to as the FRPCC analysis).[6]

In recent months, and in the context of the Fukushima meltdowns, we have reviewed the Marburger memo, the FRPCC analysis, numerous documents related to the response to the Japanese catastrophe, and other government and academic publications related to the use and benefits associated with the administration of KI in the event of a nuclear emergency. We have concluded based upon this review that Dr. Marburger's original decision was predicated on unrealistic assumptions that were flawed at the time it was issued. When viewed through the lens of the Fukushima meltdowns, these assumptions seem nothing short of absurd. What follows is a summary of our assessment:

1. The decision assumes that catastrophic nuclear events are unlikely to occur in the U.S. because of the robust design of U.S. nuclear power plants.

The Marburger memo[7] states that "A nuclear power plant accident that creates public health risks beyond the 10 mile range would be a highly unusual catastrophic event," and that "for the types of nuclear reactors in use in the United States, there are very few accident scenarios that produce [the sort of effects that would require the use of KI]." The FRPCC analysis further states that "because of the construction of nuclear power plants in the U.S., the release of radioactive materials including I–131 as a result of either a highly unlikely successful terrorist attack or failure of multiple reactor safety systems would be a very rare event and would evolve over many hours or days . . .[8]

The Mark 1 design of the Fukushima Daiichi reactors is utilized in 23 nuclear reactors in the U.S. Not only did a catastrophic failure occur at multiple reactor units at the Fukushima Daiichi power plant within hours of the loss of offsite power, but additionally, so did the first radioactive releases[9] from these facilities.

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[3] See September 29 2011 article in the *Wall Street Journal* entitled "Japan Officials Failed to Hand Out Radiation Pills in Quake's Aftermath"

[4] Please see *http://markey.house.gov/document/2011/march-16-2011-markey-sec-sebelius-regarding-ki* for a description of some of these.

[5] Decision Memorandum from John H. Marburger, III, Director of Office of Science and Technology Policy, January 22, 2008

[6] October 23 2007 Paper entitled "Interagency Technical Evaluation Paper for Section 127(f) of the Bioterrorism Act of 2002" prepared by the Federal Radiological Preparedness Coordinating Committee, October 23, 2007.

[7] See page 6 of the Marburger memo

[8] See page 8 of the FRPCC analysis

[9] See, for example, page 230 of *http://pbadupws.nrc.gov/docs/ML1117/ML11175A277.pdf* which is one of many such timelines obtained by NRC officials from TEPCO, the owner of the Fukushima Daiichi nuclear power plant, that indicate that the earthquake occurred at 2:46 PM Japan time on March 11 and that a radiation release was suspected about 11 hours later. Additionally, the November 2011 "Special Report on the Nuclear Accident at the Fukushima Daiichi

It has also become clear[10] that initial estimates of the radiation released were lower than what actually occurred, which raises questions about whether the protective measures that were ordered were adequate.

We agree that catastrophic releases of radiation are likely to be rare events in any country. We do not believe, however, that the design of U.S. nuclear reactors renders these events to be impossible within the U.S., or that their small likelihood justifies a failure to prepare adequately.

2. The nuclear accident scenario used as a basis for the Marburger decision is unrealistic.

The FRPCC analysis modeled a nuclear accident scenario that assumed a "design basis" accident[11] containment leakage, or in other words, the sort of radiation release that would occur under a "design basis" accident scenario.[12] This artificial constraint should not be used as the basis for any policy that is designed to be protective of human health in case a beyond design basis accident such as that at the Fukushima Daiichi nuclear power plant should occur.

In an April 15, 2011 letter[13] to the Nuclear Regulatory Commission (NRC), Rep. Markey asked whether any of the nineteen events (*i.e.,* stronger than expected earthquakes and tsunamis, hydrogen explosions, etc.) believed to have occurred at the Fukushima Daiichi nuclear power plant are currently within the NRC's "design basis." The NRC's response[14] indicated that only three of these nineteen events were fully considered to be within its design basis, meaning that one cannot assume that either U.S. nuclear reactors' designs or NRC regulations protect against any of the other sixteen from occurring.

It is also worth noting that the ground motion at the North Anna nuclear plant due to the 2011 Virginia earthquake exceeded the design basis for that plant.[15]

Continuing to base any decision on whether to distribute KI on a model that assumes that natural disasters, terrorist attacks or other accidents will never exceed the design-basis severity for those events flies in the face of recent history.

3. The Marburger decision is based on unrealistic accident timing and evacuation scenarios.

The FRPCC analysis[16] states that "for dominant scenarios, the offsite release of fission products may be delayed for 24 hours or longer from the start of an event," and that the scenario analyzed does not result in a large release of radiation for more than 20 hours.[17] The analysis thus concludes that if evacuations are initiated within 12 hours of the event, that the populations that might be impacted by radioactive iodine would be able to be relocated before the plume (which is assumed to be traveling at 5 miles per hour) arrives. Finally, the analysis assumes that 99 percent of those directed to evacuate would do so as directed, and uses a KI-efficacy assumption that expects that when populations were ordered to be evacuated, they might stop at KI stockpiling centers along the way in order to obtain any recommended dosages.

In stark contrast to the theoretical scenario devised by the FRPCC, what actually occurred in Japan was quite different: The area had been devastated by the earthquake and tsunami, making evacuation and communication difficult. Radiation releases began within about 11 hours of the earthquake, the accident proceeded to intensify thereafter[18] and the radioactive releases continued for some time until the reactors were brought under control.

Nuclear Power Station" by INPO notes that radiation levels of 50–120 mrem/hour were measured at the Unit I doors about 9 hours after the earthquake.

[10] *http://www.businessweek.com/news/2011-10-27/fukushima-station-discharged-more-radiation-than-estimated.html* and *http://mainichi.jp/english/english/newsselect/news/20130222p2a00m0na009000c.html*

[11] See page 16 of the FRPCC analysis

[12] *http://www.nrc.gov/reading-rm/doc-collections/cfr/part050/part050-appj.html*

[13] *http://markey.house.gov/document/2011/april-15-2011-letter-nrc-reagrding-fukushima-inspections*

[14] *http://markey.house.gov/document/2011/august-11-2011-nrc-response-inspection-questions*

[15] See for example *http://www.virginiabusiness.com/index.php/news/article/nrc-inspectors-say-earthquake-did-not cause-significant-damage-to-north-ann/314466/*

[16] See page 10 of the FRPCC analysis

[17] See page 14 of the FRPCC analysis

[18] See, for example, page 230 of *http://pbadupws.nrc.gov/docs/ML1117/ML11175A277.pdf* which is one of many such timelines obtained by NRC officials from TEPCO, the owner of the Fukushima Daiichi nuclear power plant , that indicate that the earthquake occurred at 2:46 PM Japan time on March 11 and that a radiation release was suspected about 11 hours later. Addi-

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Moreover, it took the NRC five days to order the evacuation of U.S. citizens within 50 miles surrounding the stricken reactors.[19] The Japanese government first ordered a mere 11.8 mile evacuation zone about 7 hours after the earthquake,[20] instructed those living between 1.8 miles and 6.2 miles to stay indoors after about nine hours,[21] ordered all living within 6.2 miles to evacuate after about 16 hours,[22] and only broadened that to a 12.4 mile evacuation zone about 26 hours after the earthquake, which was also several hours after the first hydrogen explosion occurred.[23] In fact, a recent article[24] indicated that "in one area, the level of radiation had surged to more than 700 times the normal level, indicating that many local residents were exposed to high levels of radiation before they evacuated."

Japan also failed to order the distribution of KI until five days after the accident began,[25] which may well have lead to an increased future risk of thyroid cancer and other thyroid disorders for the exposed population. This possibility is borne out by projected dose analysis: In May 2012, the Japanese Ministry of Education released[26] a map of the projected dose of radioactive iodine to infants under a year old, which indicates that a greater than 5 rem dose may have been experienced tens of miles away from the reactors. Problems with evacuation and communications during a crisis are not unique to Japan; The mass confusion and failures of the U.S. federal, state and local governments during Hurricane Katrina led to unnecessary deaths and other harm. And a 2003 report by former FEMA Commissioner James Lee Witt, entitled "Review of Emergency Preparedness of Areas Adjacent to Indian Point and Millstone,"[27] concluded that the NRC's emergency response plans assumed that people would comply with directions they were provided with and "do not consider the reality and impacts of spontaneous evacuation," meaning that individuals ordered to evacuate might not do so in the manner they were directed and that others directed to stay in their homes would choose to evacuate anyway. This could lead to greater than expected traffic flow and a failure to execute a timely evacuation of the area before radiation reached it.

Recent experience related to the evacuation of large populations faced with a pending emergency—or even a severe snowstorm—makes clear that these events never go as they should. Assuming otherwise ignores this history, and places these populations at unnecessary risk of harm.

4. The Marburger decision ignores the most rational scenario for KI use.

The FRPCC analysis models two basic scenarios[28] to evaluate the effectiveness of KI distribution: (1) the population is evacuated and *does not* take KI or (2) the population is not evacuated and *does* take KI.

Scenario 1 ignores the possibility (discussed above) that communication failures, a more rapidly developing radiation release than anticipated, or other problems could severely hinder any ordered evacuation. KI must be taken within a few hours of exposure to be most effective. Thus, if a radioactive plume moves more quickly than an evacuation for any reason, the exposed populations will not gain the same benefit from simply taking the medication later if they do not have access to it at the time at which they are exposed.

Scenario 2 assumes that it is possible that a release of radioactive iodine severe enough to require the administration of KI could occur but that an evacuation would not also be ordered. Since KI does not protect against the effects of any radioisotopes other than radioactive iodine, and since a release of radioactive iodine would likely be accompanied by a release of other dangerous radionuclides, this scenario seems somewhat unlikely.

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tionally, the November 2011 "Special Report on the Nuclear Accident at the Fukushima Daiichi Nuclear Power Station" by INPO notes that radiation levels of 50–120 mrem/hour were measured at the Unit I doors about 9 hours after the earthquake.

[19] *http://www.nrc.gov/reading-rm/doc-collections/news/2011/11-050.pdf* Other countries ordered similar measures. Please see, for example, page 257 of *http://pbadupws.nrc.gov/docs/ML1128/ML11285A009.pdf*

[20] *http://www.tepco.co.jp/en/press/corp-com/release/11031106-e.html*

[21] *http://www.tepco.co.jp/en/press/corp-com/release/11031203-e.html*

[22] *http://www.tepco.co.jp/en/press/corp-com/release/11031211-e.html*

[23] *http://www.tepco.co.jp/en/press/corp-com/release/11031227-e.html*

[24] *http://mainichi.jp/english/english/newsselect/news/20130222p2a00m0na009000c.html*

[25] See September 29 2011 article in the *Wall Street Journal* entitled "Japan Officials Failed to Hand Out Radiation Pills in Quake's Aftermath"

[26] Please see the maps linked at *http://ex-skf.blogspot.com/2011/05/ministry-of-education-quietly-released.html*

[27] *http://www.nirs.org/reactorwatch/emergency/epwittrpt2003.pdf*

[28] See, for example, Figure 1.1 of the FRPCC analysis

Our belief is that neither of the scenarios contemplated in the FRPCC analysis is the one that should have been analyzed. Rather, we believe it should have analyzed the scenario assumed throughout the 2004 National Academy of Sciences (NAS) report *"Distribution and Administration of Potassium Iodide in the Event of a Nuclear Incident"* that "the need for administration of KI is necessary only once to protect the thyroid gland against inhalation of radioiodine from a passing plume (cloud) and that further protection from radioiodine will be accomplished by evacuation and control of contaminated milk and other foods."

In other words, people at risk of exposure to radioactive iodine could be directed to take KI as they evacuated, not as a substitute for evacuation. We believe the Marburger decision failed to analyze the benefits associated with this most rational scenario for KI use.

5. The Nuclear Regulatory Commission staff supports pre-distribution of KI—at least to themselves.

NRC staff members who were sent to Japan to assist with the response efforts were all given KI in case it was needed, even though the majority of them were not expected to get closer to the stricken reactors than Tokyo.[29] The decision to pre-distribute KI to these individuals was a prudent measure, since it was unclear at the time how severe the radiation releases could get. The same logic should be applied to protective measures for residents surrounding nuclear power plants in this country.

In its October 3 paper number SECY–11–0137 entitled "Prioritization Of Recommended Actions To Be Taken In Response To Fukushima Lessons Learned," NRC staff recommended to the NRC Commissioners that "pre-staging of potassium iodide beyond 10 miles" be added to the list of potential regulatory changes being considered for the future.

While we believe the 2002 law already requires such pre-staging, we nevertheless commend the NRC staff for their recognition that the current 10 mile distribution zone may not be sufficient when confronted with Fukushima-scale radiation releases and Fukushima-caliber evacuation and communications challenges.

6. Many scientific and public health experts believe KI should be more widely distributed.

Section 127 of the 2002 Bioterrorism law required a study by the National Academy of Sciences on the use of potassium iodide. In 2004, its report, *Distribution and Administration of Potassium Iodide in the Event of a Nuclear Incident,* concluded that "KI should be available to everyone at risk of significant health consequences from accumulation of radioiodine in the thyroid in the event of a radiological incident . . . To be most effective, KI must be taken within a few hours before or after exposure to inhaled or ingested radioiodine . . . KI distribution should be included in the planning for comprehensive radiological incident response programs for nuclear power plants. KI distribution programs should consider pre-distribution, local stockpiling outside the emergency planning zone (EPZ), and national stockpiles and distribution capacity."

The American Thyroid Association (ATA), the leading worldwide organization dedicated to the advancement, understanding, prevention, diagnosis and treatment of thyroid disorders and thyroid cancer recommends the pre-distribution of KI to residents located within 50 miles of a nuclear reactor.[30]

We believe that the decision made by your predecessor to assert that the wider distribution of potassium iodide directed in Section 127 of the Bioterrorism Act is not needed because evacuation and contaminated food interdiction are more effective at mitigating the potential health effects associated with exposure to radioactive iodine was based on flawed science and assumptions that have been shown by the events of Fukushima to be highly unrealistic. To perpetuate this decision would require a willful effort to ignore the lessons that should be learned from the Japanese catastrophe. We urge you in the strongest possible terms to overturn it.

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[29] See for example page 91–95 of *http://pbadupws.nrc.gov/docs/ML1124/ML11244A167.pdf* According to private communications between Congressman Markey's staff and NRC staff, a small number of the roughly two dozen U.S. NRC personnel deployed to Japan since the earthquake did leave Tokyo. One toured a staging area 12 miles away from the reactor in early April, and subsequently took van tours to the Fukushima site in both early May and mid-July. This individual spent about 10 minutes inside the undamaged units 5 and 6 reactors. Another two individuals also toured the staging area 12 miles away in mid-June and took a van tour of the Fukushima site, but did not leave the vehicle they were in. These three individuals wore full protective gear, including respirators, during their tours.

[30] *http://www.thyroid.org.professionals/advocacy/documents/2011_03_30_ATA_Kloos_Holdren.pdf*

Sincerely,

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Member of Congress

BRYAN R. HAUGEN, M.D.
President
American Thyroid Association

JOHN C. MORRIS, M.D.
Secretary/COO
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Senator NELSON. By the way, Senator Markey has the distinction of having gone from the position of the most senior member of the House Commerce Committee to the least senior member of the Senate Commerce Committee.

And you asked a tremendous question about sodium iodide. Now, we are not so concerned right around here and in many other cities that are not within 20 miles of a nuclear reactor. And the industry is pretty safe at this point, but we are concerned about a dirty bomb.

So I'd like to ask the two of you going to OSTP, what is the advisability of having sodium iodide handy in the case of a dirty bomb and is it—what is unique about a nuclear facility with regard to radioactive iodine? And is that the kind of radiation that comes out of the nuclear facility that the sodium iodide would be an anecdote for as opposed to a dirty bomb? Your comments, for the record, please.

Dr. SIMON. Sure. Thank you, Mr. Chairman, for asking that question. And I think that that's a—it's a question that actually has kind of come up because people have looked at various different kinds of potential nuclear accidents and tried to sort of distinguish between them and figure out what's the most important problem involved with that.

You know, clearly during the operation of a nuclear power plant, you know, a variety of isotopes are created by the nuclear reaction and one of them is radioactive iodine. So in the context of a catastrophic accident at a nuclear power plant, it is possible to have a substantial release of radioactive iodine. Your body metabolizes it through the thyroid gland and so obviously, if you were exposed to a pulse of radioactive iodine, it will go to your thyroid and potentially cause problems.

And as Senator Markey pointed out and others have pointed out, if you, you know, shortly before or after, you see that pulse of radioactive iodine, if you take a large amount of potassium iodide, sodium iodide, whatever, usually it's potassium iodide, it sort of occupies all of the sites in your thyroid gland that the iodine would otherwise settle in. So it sort of has a sort of temporary blocking effect, until your exposure to that radioactive iodine has passed.

Now in the case of a dirty bomb, I guess the answer to the question is sort of, it depends. Not every dirty bomb is going to actually, you know, create a large pulse of radioactive iodine that you would be associated with. So it may not be actually a useful sort of prophylactic thing to do in that sense because, you know, dirty bombs are certainly different in what happens on a nuclear basis than what happens in a nuclear power plant.

Senator NELSON. Senator Cantwell.

Senator CANTWELL. Thank you, Mr. Chairman, and thanks for letting us have a second round here. I want to go back to Dr. Sullivan, thank you.

I think a lot of my colleagues are asking you questions because I think it shows the significance of a coastal economy to our Nation. And you know, I was able to ask you a little bit about the science and research you would be willing to put behind the shellfish industry, but I wanted to also ask you if you are committed to helping the industry grow. It is about—more than 3,000 jobs in Washington State and about $270 million.

And the reason I am asking that is because one of the key issues is, as the industry tries to make progress, and I always like to, you know, the geoduck industry, which is phenomenal and costs nothing to grow practically, it's outrageous what it sells for in Asia these days. You can't even find geoduck anymore in the Seattle market, that's how much the export is going overseas.

But as these guys try to figure out how to grow, the oversight, without NOAA's leadership, has been up to the Army Corps of Engineers who basically says, I don't know how to figure this out. So will you commit to having NOAA play a leadership role in trying to define how the industry grows and overcoming these hurdles with the Army Corps of Engineers?

Dr. SULLIVAN. Senator, we see tremendous potential in growing the aquaculture industry to help both preserve and protect jobs on and near the water and also contribute the United States food security. Those are the underpinning points of our national shellfish initiative.

We are working very closely, predominantly out of our Milford lab, but also out of our Seattle labs, on helping the industry develop new techniques, looking at more efficient sustainable feeds, transferring that technology to industry and, to your last point, very much working to try to streamline the permitting process and make sure that is a clearer easier path and that the scientific expertise that NOAA can contribute to that is brought to bare.

Senator CANTWELL. So you commit to playing a leadership role then and not letting this just be Army Corps of Engineers gray area?

Dr. SULLIVAN. There are, I believe, some jurisdictional issues that drive some of that, but we understand our role and take our role very seriously in helping lead on the development of aquaculture in the United States.

Senator CANTWELL. Great, thank you. And on, you know, part of our challenge here has been just where NOAA has been on nominees. Obviously, your position as administrator then—the issue of your former post and then obviously the deputy assistant secretary and so all of this has led to many rungs down on the ladder not also being fulfilled.

And one of the challenges we've seen is in getting an appointment for the Halibut Commission. So this has been open for 2 years and this has been a big challenge to move forward on policy and process. So I guess I'm asking you whether you will commit to resolving that issue in a quick time period.

I mean, there's going to be disputes about who thinks, you know, what the Halibut Commission should look like, but the issue is not to let that controversy stalemate us in getting a nominee.

Dr. SULLIVAN. I certainly agree with you on that point, Senator, and I very much recognize the importance of the International Halibut Commission to key fisheries in the northwestern waters of the United States.

I do commit to working with you to make sure that moves in as timely a fashion as possible and we will keep your staff closely informed of all updates that we get.

Senator CANTWELL. OK. And then I guess my last question—and again, thank you for answering all of these in detail, but again, it just shows you how critical this industry is to the Pacific Northwest, will you use your leadership at NOAA to drive a targeted research for the at-risk species like Alaska King Crab and will you work to leverage some of the institutions that are already in place, like the Ocean Acidification Center at the University of Washington? Obviously, NOAA and the UDub work very closely together, but what we are trying to do is leverage more of this research to move forward. We are very proud of what the Pacific Northwest has done on fisheries management issue.

When I listen to my colleagues on the other side of the aisle, we are ahead in recovery and sustainability, but we want to keep moving and obviously we have threats today. So will you commit to helping drive targeted research of these species that are at risk and using outside resources to help understand impacts?

Dr. SULLIVAN. We certainly value the partnerships that we have at the University of Washington, Senator, and we need the range of talents and the diversity of views that our University partners like UDub can bring to bear. So I do place quite a premium on working cooperatively with outstanding institutions in our states and regions.

I am not familiar with the finer points of the details of all of our fisheries research programs at this moment. If you will, I would ask to follow up with you on the question of species, targeted species research.

Senator CANTWELL. Well, I think what we are trying to—you know, Senator Collins and I had passed a bill out of this Committee several years ago on climate adaptation, basically just saying to agencies, no matter what you think of the larger political issue of how the climate is changing, we have to have some adaptation policies.

And I guess what I'm asking you is, as it relates to ocean acidification, what are the species at most risk and what do we need to do? And again, going back to that science that prevailed from the buoy information, we were able to identify a better seeding process to then——

Dr. SULLIVAN. Right.

Senator CANTWELL.—save the shellfish industry. So I guess what we're saying is, you know, targeting some of the most at-risk species like Alaskan King Crab and figuring out what we need to do in relationship to that to help that particular species survive.

Dr. SULLIVAN. You've asked me a question beyond the level of detail that I normally operate at, Senator. Let me pledge to get back with you on that.

Senator CANTWELL. OK, all right. Thank you, Mr. Chairman.

Senator NELSON. Thank you, Senator. Well, I'll do the clean-up here.

Dr. Simon, we've had a foreign oil habit in the past. What do you see OSTP can do to promote the President's Climate Action Plan which includes reducing carbon pollution and making the government more energy efficient?

Dr. SIMON. Well, thank you very much for that question, Mr. Chairman. As you pointed out, sort of our energy policy in this country actually has to operate on a number of different facets. It has to operate on a level of making sure that we utilize our energy as efficiently and effectively as possible and obviously we have to keep in mind that there is this balance that we have to strike between our energy policy objectives and our environmental policy objectives. They are both important and we need to make sure that we, you know, accomplish both of them.

I think that we've had, you know, in the last couple years, some successes in moving the needle on our foreign import dependence. In 2005, we were 60 percent dependent on foreign oil imports on a net basis. Last year, we were 40 percent dependent, OK? That's a big Delta. And there are a couple of reasons why that happened.

OK, one reason is we became more efficient. Cars and trucks, particularly light-duty vehicles, use less oil and gas, use less petroleum, to go than they did before. So our improvement in the energy efficiency in cars, which is driven in large part by the 2007 Act and the work of this Committee in providing a framework for increase in fuel economy standards, was a big part of that.

Another big part of that is that we've seen, through the power of technology, increased domestic production of oil, particularly petroleum and gas. In the last year, we had a 15 percent growth in our domestic reserves of oil.

And so these elements, you know, more efficient use, more supply, a more diverse supply, you know, we have more ethanol in our gasoline stream now than we did 10 years ago. About 10 percent of our gasoline is ethanol. Those have all come together to drive down our import dependence and will continue to do so. And I think that the President is committed to progress on all those fronts and I think that it will make a difference in the future, in terms of our energy security and our economic security.

Senator NELSON. Dr. Handelsman, one of the things we need to do is to translate federally funded scientific discovery out into new companies. Give us some of your ideas.

Dr. HANDELSMAN. Thank you for that question, Senator Nelson. I think this has been an area of increasing interest in the Federal agencies that fund our fundamental research. There is no question that the basic research is what fuels many of the companies and much of the technology that we've seen develop over the last 50 or 60 years in this country. So I think the basic research engine has to be kept strong for that to be a robust process.

But in addition, a number of the agencies have developed programs focused on translating basic research into applications. My understanding is that those are very successful programs. A recent one at NSF, the I-Corps program has a new experiment, but I think it provides an interesting model to analyze. Any decisions that we make on that, I would want to see data about. I think we need to very carefully look at the efficacy of programs of that sort. And since I haven't seen an evaluation, I wouldn't advocate one or another right now, but that is something I would really look forward to working with you on, Senator.

Senator NELSON. How would you characterize STEM education in the U.S. today?

Dr. HANDELSMAN. Well, thank you for your question. And of course, I've studied quite a lot and have a great interest in. STEM education today, I think, is still strong but is faltering and we need to make some radical changes in the way that we teach and the programs that we offer for those who teach, as well as the students, at every level.

I think the current strategic plan from the administration is quite robust, focuses on the three goals of producing 100,000 more STEM teachers and a million more STEM graduates at the college level, as well as public outreach in STEM. And I think that plan has many, many elements that will radically change the STEM system.

In particular, I think we need to focus on the college education we offer because, in college, we see a 60 percent attrition of students who start college interested in STEM but graduate in other fields. If we simply reduced that 60 percent loss to 50 percent, we would be three-quarters of the way toward the increased production of STEM majors that the President has targeted of one million majors in the next decade.

Senator NELSON. With all of the many scientific priorities, how do we go about making sure that our research agencies adequately address the multitude of issues that are in front of us?

Dr. HANDELSMAN. Well, thank you for your concern on that issue, Senator. It is one that I certainly share. And I think that one thing that we can use is the collaborative nature of the agencies as well as the convening power of OSTP to foster those collaborations.

And one of the things that I think we perhaps don't do enough of in the research world as well as in the funding world is work across agencies to identify priorities and then figure out strategic investments that balance the strengths of the different agencies and avoid duplication.

So I think that's a process. I don't think there is a single answer to it, but it takes rigorous review of the anticipated changes that our Nation is facing, the major research initiatives that are needed to confront those challenges, and then working with the agencies to collaborate on effective research approaches to solve those problems.

Senator NELSON. Dr. Sullivan, I've talked with you privately about the RESTORE Act and the need to get that money out in the assessment of the fishery stock, so I won't go into that here.

There is nothing like an approaching storm to focus in the attention of the country. And your agency has the tools that have done such a tremendous job in the past. As an administrator of NOAA, tell us what are your goals to try to improve hurricane tracking and forecasting?

Dr. SULLIVAN. Senator, that's an absolutely critical question near and dear, of course, in particular to your heart as a Floridian, I know. We have been working—we work very closely with academic partners and our own laboratories to try to improve our skill in forecasting both the track and the intensity of hurricanes.

We mounted, some years ago, a hurricane forecast improvement program that brings the best scientific minds together to identify where the most promising leverage points are in both of those arenas and then mount very focused observing modeling and research process study efforts to unlock those.

HFIP has produced some very good progress when it comes to track and intensity. The error curve on track has gone steadily down over the last decade or so. The intensity problem is a tougher–to crack, we are honestly not there yet. It is just stuck at about the same level we had some decades ago.

I believe we have a promising capability now in hand, and a candidate transition into operations, and that is the Doppler radar that we fly in our hurricane research birds through the stinger that you're familiar with out of the tail of the P–3.

So there is not a single answer. It will turn out to be both about better understanding and better representation of the actual physics of the storm itself, as well as better understanding of the larger scale surrounding processes that control where a storm moves.

Senator NELSON. For the Committee's information, explain how you can increasingly, in these tight budgets, utilize commercial assets. Information, for example, coming off of commercial satellites, in order to help improve your tracking.

Dr. SULLIVAN. We take advantage of commercial sources for targeted weather data today. We purchase data from several Mesonets that run wind profilers and lightening sensors in different highly populated portions of the country.

And perhaps most powerfully and innovatively, we work collaboratively with private sector entities to equip commercial airliners with small instrumentation packages that give us measurements, vertical measurements, through the atmosphere of temperature and moisture as the two main drivers of the energy in the atmosphere as the aircraft make their transits and in particular, of course, their climbs and their descents.

We do a lot of that now. There are some potentially promising alternatives developing in the corporate sphere as we speak. I think my priority as administrator, if confirmed, would certainly be to be sure we are staying on top of what new private sector arrangements might genuinely be viable, but also doing that with a study die. One of the lessons that I learned in my astronaut days, and I know it is one that you appreciate keenly Senator, is when things are really critical, you make sure you make the second connection before you undo the first connection. That's how every space walker handles their safety tethers, I can promise you that.

And when it comes to the critical data streams that fuel our weather forecast, I believe that is the philosophy that we need to follow as well. I look forward eagerly to promising new developments that might let us change the equation, but be sure we have seen firm proof of their viability before we make a change.

Senator NELSON. Before I turn the Committee over to Senator Begich, would you explain the importance of the mission, in a few years, of warning us earthlings about a solar explosion?

Dr. SULLIVAN. I would be glad to do that, Senator. We, of course, live on a planet that orbits a very dynamic star and it can send out, periodically, tremendous bursts of radiation and chunks, literally large chunks, of magnetic field, streaming toward us at millions of miles an hour. There are several ways that we monitor and alert our communities to be aware of the kinds of impacts that this may have.

Our GF stationary satellites have instrumentation packages aboard them that can detect energetic X-rays and other symptoms of the charged particle stream that is coming our way. We and the Defense Department and the United States Geological Survey operate ground-based networks of magnetometers that can detect the currents, the electrical currents that those chunks of magnetic field can induce in the earth. Those are of grave concern to operators of long-range transmission lines, long run pipelines that, from an electrons point of view, are just a big long conductor in which you can make charge flow.

A very vital asset in providing these predictions is also, in effect, a weather buoy. A satellite currently called ACE, the Advanced Composition Explorer, that sits a million miles away from Earth, along the line to the Sun, and basically functions as the early warning sentinel when one of these blasts is really coming our way.

So the actual doing of all of this is a very close collaboration between our colleagues at NASA, who are responsible for the fundamental understanding of the Sun, our partners in the Defense Department, who hold the military forecasting responsibility for severe weather events, and our own Space Weather Prediction Center.

I should add that the other sector of our economy that is very significantly interested in this, of course, is the entire space commerce satellite operator segment because these vast streams of charged particles can disrupt, damage and destroy very precious satellite systems.

Senator NELSON. Senator Begich.

STATEMENT OF HON. MARK BEGICH, U.S. SENATOR FROM ALASKA

Senator BEGICH. Thank you very much, Senator. Thank you for all being here. And I just have a few questions. I appreciate you being patient and going through this process of nomination. And again, I wish you all the best in the process moving forward.

First, Dr. Sullivan, thank you for, one, coming to Alaska, as you have done and the conversations that we have had on many issues that Alaska faces. I always joke with the Commerce Secretary that half of her job is fisheries. Three-quarters of your job is fisheries. There is a lot of satellite activity and other things you work on, but my view is fisheries is a pretty important issue for us.

Let me talk to you about one quick issue and this is about the whole issue of pirate fishing, basically people stealing our fish. I know there is a fancy word for it, illegal, unreported, unregulated—no one understands that. They are pirates. They steal our fish and then they try to sell it to us.

And so when I look at the issue of the crab industry right now, the crab fishery and the Russians and what they are starting to do now, and have been doing for some time for us, we estimate just alone, in the losses to our fisheries in the crab industry, almost a half a billion dollars, by pirate fishing as well as claiming to be Alaskan crab which, of course, we know from my state that's a premium price. If you have Alaskan crab versus Russian crab, Alaskan crab gets premium because, of course, it's better.

So if confirmed, what will you do to help? I know we have legislation but, I mean, what can you do from your administrative standpoint to have these pirates dealt with? I have my way of dealing with them, but that's an Alaska way, so.

Dr. SULLIVAN. I think I'm not certified to use your Alaska method.

Senator BEGICH. We will help you.

Dr. SULLIVAN. Pirate fishing is an absolutely vital issue that we at NOAA will continue to work on very ambitiously with our partners at the State Department and other agencies, as appropriate. We work, as you know, very closely with the United States Coast Guard. They are our fisheries enforcement presence. Surveillance and enforcement is one key part of the solution to this.

But working hard on the international front, through the various bilateral agreements and treaty agreements that we have is really the other key lever. This is something NOAA has worked on very hard over the past 4 years, striking new accords with the European Union, among other parties. We continue to work it through many of the Pacific region, regional marine fisheries organizations. I can assure you it will remain high on my radar screen, high on the radar screen of my Assistant Secretary for Conservation and Management, and we look forward to working with you to find what solutions may be brought to bear.

Senator BEGICH. Fantastic.

Dr. SULLIVAN. It's a long run and a tough problem, but it must be solved. Our fishermen deserve a level playing field.

Senator BEGICH. Is the State Department working with you? Do you think they understand the importance? I know they have, you know, higher items on their list every day, it seems, and this may not be registering. Do you think it is registering enough?

Dr. SULLIVAN. I believe it does register. It certainly registers very strongly on the radar screen of Assistant Secretary Kerri-Ann Jones and we've worked very closely with her. And I think we've got the right links within the OES division of State to work this issue and the priority to take it higher when we need to.

Senator BEGICH. OK. As you progress on that, keep us informed. And I sit on the Subcommittee on Appropriations for State and Foreign Ops and I would be happy to know if there is any issues that may need funding capacity, too. So please keep us informed.

Dr. SULLIVAN. We will do that. Thank you, Senator.

Senator BEGICH. You bet. Another issue, and you and I have talked about it on fisheries, and that is the whole issue of the Arctic and the research capacity. I know there was questions earlier about research and vessels and so forth, but let me be more specific. You, I think, are aware that I have an Arctic Research Bill, 1344, which is trying to get some additional resources and capacity and getting the Commission, the Arctic Commission, to have capacity for grant making.

It's kind of a two-part question. First, do you believe there is a need for additional research and monitoring within the Arctic and the environment and what we are doing there? And second to that is, are you familiar enough with my legislation to make comment on it at this time? Go ahead.

Dr. SULLIVAN. Senator, as the dynamics of the Arctic region change, as shipping changes, as nations adjust their policies and commercial activity grows, it is going to be absolutely indispensable that we have better environmental data from that region.

As you know, we've worked closely with a number of the oil companies that have been active in the Chukchi and the Bering Sea. We've made cooperative arrangements with them to get some additional data. It is something I care about and am concerned about very much because the rate of change is frankly faster than the rate of program change has been in the past year.

So I do look forward to working with you to try to move forward at the right rate and with the right activities in that regard. I am broadly familiar with the outlines of your Bill, but not with its finer detail and points. I did have a good discussion on some aspects of it with Fran Ulmer when I was last up at the state.

Senator BEGICH. OK.

Dr. SULLIVAN. I would be happy to look at it more closely and get you a detailed comment.

Senator BEGICH. I would appreciate that. And then on top of that, I think the industry—we did something maybe two and a half years ago, give or take, where we were able to get several of the industry folks to sign an MOU——

Dr. SULLIVAN. Right.

Senator BEGICH.—with NOAA to share that data, have some basic lines of understanding of that the data is that you would like to have them look at——

Dr. SULLIVAN. Right.

Senator BEGICH. So there's not a debate over the data, it's looking at the results of the data. And do you believe that has been helpful or will be helpful in the future, that kind of MOU where industry and agency are working together?

Because they'll spend, I'm guessing on Shell alone, they'll probably spend $50-plus million on research, which, I mean, you would probably love a research budget like that for the Arctic. But I mean, just to know that they'll do that, do you think that that sharing arrangement is going to be helpful?

Dr. SULLIVAN. The MOU that we already have with Statoil and Shell and ConocoPhillips has definitely been valuable. In the first few months of the very first season, it doubled the number of weather observations——

Senator BEGICH. Fantastic.

Dr. SULLIVAN.—in the Chukchi Sea. So that alone is indicative of the promise that it offers for the future. As you know, it contains many annexes, touching on different categories and different disciplines of data.

Senator BEGICH. Right.

Dr. SULLIVAN. Those have come on in due course and we look forward to working with the companies in the seasons ahead to get the data from those new agreements. So weather has already paid a dividend and I see great promise in the other ones, so we will continue with that.

We have talked about that and factored it into other plans. It's something I discussed with other parties up in the region on my last trip through the state. I think it's a model of a kind of arrangement we can use to an increasing degree.

Senator BEGICH. Fantastic, good. Let me ask you, one area, as you know, we've had some issues with the EIS and the Arctic, the Environmental Impact Statement, on Arctic oil and gas drilling.

Early on, we had many different agencies kind of doing their own thing and now there is an interagency working group, as you know, among the different agencies that touch the Arctic. So there's a—I don't want to call it necessarily a one shop stop, but it's a more coordinated effort to understand what each agency is doing. I still have some concerns about how that EIS is moving forward, but am recognizing that there is multiple potential developments going to happen there and that the EIS needs to understand that.

I guess mine is a more fundamental question. I know you and I have talked about this and that is, do you believe that, one, NOAA needs to continue to be part of that interagency working group? And two, does NOAA recognize that oil and gas development is moving forward in the Arctic? It's not a question of denying oil and gas development, it's about how to manage it for the best end-result, environmentally as well as economically and job opportunities. I'll let you—it's kind of a one, two question.

Dr. SULLIVAN. I very much believe that NOAA needs to remain engaged with the interagency working group on permitting, Senator. Both the scientific expertise that we bring on a number of areas and legal responsibilities and mandates that we hold really require that we do that, so we will stay engaged on that process.

And with respect to the DEIS, we take your point and recognize very much, as the President's recently released National Strategy for the Arctic Region says, that energy development and expansion of commerce is something that clearly is happening and is going to happen in the Arctic region. We, as a country, need to be prepared with the right scientific information, the appropriate response capabilities from search and rescue to spill response, as might be needed, and ready to allow that to go forward in a responsible fashion.

Senator BEGICH. Fantastic. Let me, if I can, go to two quick issues and then I have one last quick question for each of the remaining two nominees.

One is on the Weather Service and the hiring freeze issues. You know, I am starting to hear that maintenance issues, forecaster slots, I mean, I can go through the list of what's happening. I recognize this is a sequestration issue, but tell me your sense now of how you look forward with regard to the weather service and ensuring that we have the right staffing in these very tight financial conditions you're working in.

Dr. SULLIVAN. Thank you, Senator. I did implement an agency-wide hiring freeze in response to the continued uncertainty about both sequestration and the FI–13 appropriations process. It was an unfortunate but a necessary and a responsible management action to take at that time.

We instituted, at the same time, a board to review any needs for mission-critical positions that might come up and receive input from any of our operating line units about where we needed to be sure that we filled a critical vacancy. That group continues to work and we are very focused on making sure that we do all we can to not short-key mission priority seats.

I know you understand the real dilemma here, however. And that is the need for and the urgency surrounding the provision of NOAA's services across the entire agency continue to go up. They go up in response to increasing numbers and intensity of extreme events. And in your state, they go up because of the rate of environmental change and the expansion of human activity in the Arctic region. No business can really carry on with customer demand, as you are going up, and income going down without eventually doing more with less becoming do less with less.

It is a very real dilemma. I know it faces members of this body. It certainly faces all of us charged with managing Executive Branch agencies.

Senator BEGICH. That's OK. I'll hold my rant here in a second on the budget, but the National Marine Fisheries Service, are we close, do you think, to having someone in that position at some point here?

Dr. SULLIVAN. I am working very actively on that, Senator. It is one of my absolutely highest priorities.

Senator BEGICH. Thank you very much. Let me, very quickly—Doctor, is it Handelsman? Handelsman? On STEM education, this might be more of a commentary, but I just want to make sure you know where I'm coming from.

When it comes to the area of STEM education, I like to call it STEAM, Science, Technology, Engineering, Arts, and Math, but the important part here that I want to really stress, I know the President's last budget wanted to consolidate a lot of these. I'm opposed to that, especially around this arena, because it's very specialized work. And I know there was, I think, five categories kept out in that original 2013 proposal. I have no idea what they are planning as they work through this next cycle, I just want to make sure you know where I am on this.

As the Chair of the Oceans Subcommittee, I think it is critical that we ensure, for example, the Sea Grant program and others have access in being able to do what I consider very specialized STEM education. That is not when you walk out to the mainstream out here, they think of engineers, they think of mathematicians, no disrespect to astronauts, but you know what I'm saying here.

And I just really want to stress this point that this—I recognize the work of consolidation and I'm all for trying to figure out efficiencies, but sometime in efficiencies, you lose emphasis. In an area, I can tell you, one that pays good when they are working, but we have to have people that are working in this field. So I just wanted—I don't know if you have any comment, I just wanted to make sure you heard that from me.

Dr. HANDELSMAN. I appreciate hearing it from you, Senator, and I agree with all of the principles that you just stated. The consolidation, as you know, was initiated by Congress to look at efficiencies and defragmentation of the programs. And so I think we all agree on basic principles that were the reason for looking at our 226 STEM programs across 13 agencies.

Senator BEGICH. Right.

Dr. HANDELSMAN. And I am completely supportive of the efficiency and non-duplication principle, but I think we can protect those principles, as you said, without damaging or cutting into any of the programs that are specialized in one particular agency or another or have been proven to work in their current condition or formulation.

And so I haven't reviewed or heard the nuances of the arguments of why the certain consolidation choices were made, so I wouldn't want to make a——

Senator BEGICH. OK.

Dr. HANDELSMAN.—a judgment about any one of them at this point, but I certainly assure you that I think we need to balance the specialized program concerns, particularly in NOAA and NASA. I agree they are unique programs.

I should mention though that in the current budget, I believe that the NOAA Sea Grant College Fund are——

Senator BEGICH. Are protected.

Dr. HANDELSMAN. Right, protected and increased and include a $10 million increase for the Grand Challenge in Ocean Mapping.

Senator BEGICH. Absolutely.

Dr. HANDELSMAN. So I think that was a strong positive.

Senator BEGICH. We consider that an A+. Thank you very much.

Dr. Simon, let me—I just want more of a general question. You heard the conversation I had with Dr. Sullivan about Arctic oil and gas exploration and the President's view. I heard a little bit when I came in, Senator Nelson's conversation you had, I think, it sounded like the Gulf you were talking about, I'm not sure.

But I want to make sure, in your new role, you understand the importance of oil and gas development in the Arctic, recognizing there is challenges but recognizing it is happening. It's not a question of if it is happening any longer.

Dr. SIMON. I do, sir. And I agree with you, I think that certainly in the Beaufort and Chukchi Seas, we have tremendous offshore resources that are in the process—we are in the early stages of trying to develop them. We have to do that in a safe and effective way. The President very clearly has that as a high priority and I look forward to working with you, and anyone else interested, in making sure that happens.

Senator BEGICH. Fantastic, thank you.

Let me end in just, again, thanks to all of the nominees. As I said, I won't get on my rant about the budget, but I will say one thing. It is a shame that we are at this point. You know, we have a budget that has passed the Senate. I didn't support it, but it passed. The House passed a budget. And for all the politicking in this place, we sure—it seems like we could sit down and resolve this budgetary issue. But because of just pure partisan politics, we are unable to.

And it's really a shame and, I think, it's a disgrace to the American people that we can't get a budget. After three years of being hammered on that we did not have a budget, we pass a budget and now we can't sit down, as one another, and figure out how to solve this. Not you, as administration, but the minority and the majority, the House and Senate.

I think the American people are, more and more everyday, getting fed up with the penny-ante politics that go around here. They want to see results. And maybe this next few weeks may be painful, as you see some of the news reports right now on, you know, debt, extending the debt limit, dealing with the budget, the shutdown.

I will tell you the Appropriations Committee has passed 11 of their 12 appropriations bills on the Senate side. We are ready, but it seems the way this place operates on the Senate floor is, you could have an item like we have now, an energy and efficiency, but we are going to talk about everything but that. It's the most amazing thing.

When I was Mayor of Anchorage, they would never ever allow a non-germane discussion. If you want to have that issue, bring it up in another forum. But the American people want us to get our work done.

And to you all, that hopefully will be approved, the Federal Government, we are in the business of services. We are a service company, that's who we are, the largest service company in this country. We deliver services every single day. If we continue to do as—a great example, customers are increasing, because unless I missed something, the population is not shrinking in this country, on many aspects. And because of that, as the population grows and we keep cutting to the bone or below the bone or into the marrow, the net result is we will not provide the services that the American people want and need in this country, core basic services.

And when you think about weather, the things that you've been able to do, you know, the Sandy storm could have been even greater damage without the knowledge that we have. When we have troops fighting overseas, it is weather that helps us determine when those troops move in certain areas. A lot of people forget that. It's not just about turning on the Weather Channel and thinking about how you drive to work that day.

There's many other aspects to the services you provide that are really given free to many people, to utilize, to better their lives and plan their business or, in the case of the military, plan how to maneuver in foreign countries, as well as training. The list goes on and on. The airlines—you know, the shopping list is unbelievable.

So we have to be careful here. And I would hope that some of my colleagues on the other side of the aisle would recognize that we are a service company. We provide service and we should be the best of any company. And for us to degrade the service every single day by nitpicking or doing 6 week budgets is irresponsible.

So that's—I'm talking to you, through you. This is my rant. When I get the mic and they let me close it off, that's how life works. I've learned this from my colleagues after 5 years, so I will take the advantage.

Again, thank you all very much. Thank you for your willingness to serve, to your families that support you, because I know you cannot do it alone. And I really greatly appreciate you sticking through this time and listening to a lot of questions and rants.

I think I need to keep the record open for—seven? The record will be kept open for 7 days for additional questions from members of the Committee.

The Committee is now adjourned.

[Whereupon, at 11:41 a.m., the hearing was adjourned.]

A P P E N D I X

PREPARED STATEMENT OF HON. BARBARA BOXER, U.S. SENATOR FROM CALIFORNIA

I would like to congratulate Dr. Kathryn Sullivan on her nomination to be Under Secretary of Commerce for Oceans and Atmosphere and Administrator of the National Oceanic and Atmospheric Administration (NOAA). She has served as the Acting Under Secretary of Commerce for Oceans and Atmosphere and Acting NOAA Administrator since February 2013, and I look forward to her continued leadership.

Dr. Sullivan has roots in my home state of California where she spent much of her childhood. She earned a bachelor's degree from the University of California, Santa Cruz before going on to receive a doctorate from Dalhousie University in Canada.

Dr. Sullivan has exemplary professional experience from her time in the Federal Government, and the non-profit and corporate sectors. She previously served as NOAA's Chief Scientist, in the U.S. Navy Reserve, and in the NASA astronaut corps, which makes her nomination to be the Under Secretary of Commerce for Oceans and Atmosphere and NOAA Administrator especially fitting.

In her role, Dr. Sullivan will be responsible for programs that protect our coastal ecosystems and coastal economy, and help address the threat of climate change, to name a few.

NOAA's role in protecting our coastal ecosystems and sustaining our coastal economy is so important to California and our Nation. National marine sanctuaries help preserve our magnificent marine and Great Lakes areas for generations to come. And, in California alone, half a million jobs and $36 billion in economic activity depend on ocean tourism, recreation, and fishing.

NOAA also plays an essential role in providing up to date climate science. From record high temperatures, to severe wildfires, to severe storms, to shrinking Arctic sea ice and rising sea levels, the agency's climate data and monitoring supplies critical information charting the growing impacts of this climate disruption on our country. Continuing NOAA's science driven mission is crucial in helping our Nation confront the very real threat of climate change.

Once again, I congratulate Dr. Sullivan on her nomination, and I look forward to continuing to work with her on these and other important issues.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. AMY KLOBUCHAR TO DR. ROBERT M. SIMON

Question. In Minnesota and across the country we have seen the positive impact that renewable fuels and other bio-based products have had on small towns and rural areas. Renewable fuels provide good jobs, improve the environment, and help us to reduce our dependency on unstable parts of the world. If confirmed what will you do to encourage continued research and development in bio-based products?

Answer. Thank you for asking me about this important topic. As you point out, bio-based products, including renewable fuels, play an increasingly important role in our economy. By one rough estimate, in 2011, bio-based products such as biofuels, biologically based materials, chemicals, and industrial enzymes accounted for more than $115 billion in revenues in the United States alone. The scope of the products being produced from bio-based starting materials is also expanding. While the large-scale production of bio-based products started with ethanol production for fuel purposes, technological advances spurred by research and development (R&D) expenditures related to biofuels have resulted in new products and market opportunities to use bio-based materials in cosmetics and as replacements for higher-value petrochemicals, such as plastics. These new economic possibilities, in addition to the introduction of second- and third-generation biofuels that can be used as "drop-in" replacement fuels, will strengthen the opportunities for economic growth in small towns and rural areas. Indeed, in February of 2012, the President issued a memorandum for the heads of executive departments and agencies directing them to take a series of important steps to significantly increase Federal procurement of biobased and other sustainable products, in essence to use the purchasing power of the government to drive innovation and create jobs.

Key to all of this is maintaining the strength and diversity of the R&D base that supports bio-based innovation. If confirmed, I would work with my colleagues in OSTP and elsewhere in the Administration to pursue strategies that would encourage this growing segment of our economy. That would include working with the Department of Energy and the Department of Agriculture to ensure their efforts are strongly aligned with each other and focused on the most compelling opportunities for bio-based applications in the future, supporting efforts by universities to work more effectively with industry to move R&D advances out of the laboratory into the marketplace, and working with colleagues in the Administration to ensure we have the trained personnel needed to support future bio-based R&D and its applications.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. JOHN THUNE TO DR. ROBERT M. SIMON

Senate Experience

Question 1. Dr. Simon, how will your experience as a Senate Committee Staff Director, both in the Majority and the Minority, influence how you will perform your job at OSTP?

Answer. Thank you for asking this question. One of the things I learned as a Senate Committee Staff Director, both in the Majority and the Minority, was that when you get down to the substantive details on important issues relating to energy and environment, there are usually openings to finding bipartisan common ground. The chance of finding those openings is greatly enhanced if one is listening to and respecting the voices that come from a range of regions, communities, and stakeholders with an interest in a given policy area. In particular, I have found that Members and their staffs from across the political spectrum invariably have useful information and insights to contribute. Listening carefully to that broad input helps one understand the potential real-world effects of any particular proposal. Searching for common ground across party lines is generally the best way to make progress on an issue—certainly in the Senate, but also in government more broadly. I hope to apply these lessons that I learned in the Senate to the issues I will be responsible for at the Office of Science and Technology Policy (OSTP), if confirmed.

STEM program streamlining

Question 2. This April, the OSTP and the Office of Management and Budget proposed a Federal STEM reorganization plan with the goal of eliminating redundant and ineffective STEM education programs. Members of Congress from both parties have raised concerns about this proposal, claiming that it would eliminate effective programs and that it ignores the expertise and tools that exist within mission agencies like NASA and NOAA. How would you work with Congress going forward to improve the coordination and efficiencies of these programs across the Federal Government?

Anwer. Thank you for this important question. Both the Congress and the Administration share the common goal of improving both the coordination and the efficiency with which the Federal Government carries out its activities related to STEM education. The Committee on Commerce, Science, and Transportation has played a leading role in advancing this by authorizing the formation of a committee under the National Science and Technology Council to coordinate STEM education in the very first substantive section of the America COMPETES Reauthorization Act of 2010. This Committee on STEM Education (CoSTEM) has been facilitating planning, coordination, and implementation activities to create a more effective set of Federal STEM education programs. If confirmed, I would stay abreast of Congressional interest in, support for, and perspectives on STEM programs, particularly relating to the program areas of OSTP for which I would have responsibility. I would look forward to working with you and this Congress as we look for the best ways to use Federal STEM education programs to improve STEM education and encourage greater participation in STEM careers.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. JOHN THUNE TO DR. JO HANDELSMAN

STEM program streamlining

Question 1. This April, the OSTP and the Office of Management and Budget proposed a Federal STEM reorganization plan with the goal of eliminating redundant and ineffective STEM education programs. Members of Congress from both parties have raised concerns about this proposal, claiming that it would eliminate effective programs and that it ignores the expertise and tools that exist within mission agencies like NASA and NOAA. How would you work with Congress going forward to improve the coordination and efficiencies of these programs across the Federal Government?

Answer. Thank you, Senator Thune, for this question. As you know, STEM education programs are of particular interest to me and, if confirmed, I would look forward to working to make them as strong and efficient as possible. Since I think we all believe in the fundamental principles of efficiency and coordination that underpinned the reorganization, I would examine the programs, determine the rationale for choices, and work with the Congress to build the best constellation of programs we can. I have a collaborative leadership style and would enter into this process with a presumption of fostering collaborative relationships. If confirmed, I intend to address this issue with the kind of cooperation that Congress and the Administration proved possible when, under the leadership of this Senate committee, the America COMPETES Reauthorization Act of 2010 was enacted.

There is reason for optimism. The America COMPETES legislation led to the creation of the new National Science and Technology Council (NSTC) Committee on STEM Education (CoSTEM). CoSTEM recently released a 5-year Federal STEM Education strategic plan, which I understand has been well-received both inside and outside government. Already, CoSTEM member agencies are working together to implement the strategic plan's vision of a more effective, efficient, and coordinated Federal STEM education enterprise that sustains and builds upon agency capabilities and assets in STEM education.

If confirmed, I would look forward to working with you, CoSTEM member agencies, and the scientific community to implement that strategic plan in a manner that achieves our shared goals. The principles I would strive to uphold are twofold: (1) we should protect programs that are supported by evidence; and (2) we should honor the unique features and capabilities of our Federal agencies to deliver the best STEM education programs to our students and institutions of education at all levels.

The "Scientific Teaching" Method

Question 2. Dr. Handelsman, could you explain the "scientific teaching" method you have developed and written about, and discuss how that model could help improve U.S. STEM education?

Answer. Scientific teaching has a number of meanings. First, it is about using evidence in teaching, just as we do in scientific research. This means relying on scientific research about learning in making choices about classroom practice, and incorporating regular informal and formal assessment of learning into teaching, just as we include metrics for scientific phenomena in scientific research. Second, scientific teaching means treating the classroom more like a research lab. A key aspect of research labs is that they capitalize on the different talents and strengths of each member through hands-on lab work and creative problem-solving. This approach should be extended to the classroom such that teaching methods are adapted to further expand opportunities for students from diverse backgrounds to participate more fully in the learning process. Finally, scientific teaching is about scientific content. This means teaching the process of science and scientific thinking as well as the products of scientific investigation.

Scientific teaching can be a useful framework to apply to the Federal education agenda because it provides a roadmap to three key elements highlighted in the CoSTEM strategic plan: Our choices should be evidence-driven; we should foster diversity and use it to strengthen the teaching in STEM classrooms; and we should emphasize the process as well as the products of scientific investigation. If confirmed, I would look forward to working with you and this Committee to realize these goals.

RESPONSE TO WRITTEN QUESTION SUBMITTED BY HON. AMY KLOBUCHAR TO DR. JO HANDELSMAN

Question. I appreciate your focus on increasing the presence of women and girls in STEM fields. What steps would you take to particularly encourage females to pursue educations in careers in science, technology, engineering and math?

Answer. There are two types of approaches to increasing representation of women in STEM fields. One involves interventions that are generally helpful to all STEM students and workers, but have a differentially positive effect on women, and the second is specific to girls and women.

The general approaches to attracting and retaining students in STEM fields first involve improving pedagogy in STEM teaching at all levels. The broad group of teaching practices known as "active learning," which engage students actively in acquiring knowledge and expertise, have a differentially positive effect on performance and retention of girls and women in STEM fields. Research shows that training teachers in active learning techniques does not seem sufficient to change their practices in the classroom—they themselves must learn in STEM classes through active learning to incorporate these approaches in their own classrooms. Therefore, it is critical that we adopt active learning approaches at the college level so that future teachers at all levels—K–12, college, graduate, and postgraduate—experience active learning and consequently use it in their own teaching.

Second, there are a variety of tactics that can be used to increase retention of women and girls in STEM in college. A high priority should be to incorporate research courses and other research experiences into college courses taken in the first two years of college, before the attrition from STEM majors occurs. These courses can be linked with K–12 classrooms in which younger students play a role in the research projects and the college students mentor the younger students, electronically or in person.

Approaches that are specific to girls and women in STEM fields generally involve providing role models. Research indicates that most people do not pursue paths where they do not see people "like them." In child development, as gender identification becomes more important to a girl's self-image, she is less likely to remain in STEM. Therefore, it is essential to provide diverse role models with whom girls can identify in all areas of STEM. Using examples of women scientists throughout science fields, making prominent women scientists visible to young girls, and incorporating women scientists into the scripts of prime time television are proven methods for providing role models.

Finally, women often drop out of STEM fields at higher levels because of a lack of institutional structures to support work-life balance. Key interventions that promote women's careers include explicit discussion of career options, role models who have combined family and successful STEM careers, provisions for pregnancy and breast feeding, and maternal leaves that do not penalize women.

If confirmed, I would work with educational institutions and Federal funding agencies to continue to invest in research and to provide and incentivize programs and policies that would foster the evidence-based interventions and innovations described here.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. JOHN D. ROCKEFELLER IV TO DR. KATHRYN SULLIVAN

Question 1. We appreciated your expressions of support for cooperative management, the process through which fishermen and other third parties including research institutions work collaboratively with the agency to collect data, produce necessary science, and otherwise help manage the fishery resource that is of mutual concern. What is your vision for how cooperative management could enhance fisheries management, and how can the committee help you achieve that vision?

Answer. Cooperative research and management is essential to NOAA's core mission to sustainably manage marine fisheries that ensure these valuable resources contribute to healthy ocean ecosystems and thriving coastal communities and economies. NOAA has a long history of cooperative research and management and will continue to leverage the capacity of a widely distributed network of partner academic institutions, commercial and recreational fishermen, state and tribal leaders, interstate marine fisheries commissions and other entities to improve the science and management of our Nation's valuable marine resources. Cooperative research and management also is helping us build greater confidence in the science and management. Congress can help by continuing to support the FY 2014 Presidential Budget which includes an increase of $1,029,000 for cooperative research and supporting other areas of the NMFS budget that include cooperative research and management.

Question 2. As you assume your new portfolio at NOAA, cooperative management will be one of many priorities and is unlikely to receive your direct attention on a daily basis. Who on your team do you expect to take day to day responsibility for this issue?

Answer. Sam Rauch, NOAA's Acting Assistant Administrator for NMFS, and Dr. Richard Merrick, the Chief Science Advisor for NMFS, have made cooperative research and management a top priority. I rely on their leadership on this, and I know they are not only strengthening our partnerships, but are seeking out more ways to collaborate effectively with partners in academia, industry, and other entities. In addition to Mr. Rauch and Dr. Merrick, Dr. Mark Schaefer, our newly confirmed Assistant Secretary for Conservation and Management, has this issue in his portfolio, and I will look to him to keep me informed of progress in this important area if I am confirmed.

Question 3. In these tight budget times, outside funding for cooperative management could be essential. Does the agency have the authority and appropriate mechanisms to receive private resources for projects that involve NOAA and third parties?

Answer. We are looking for opportunities to leverage resources (*e.g.,* seeking funding and in-kind contributions from non-Federal sources) in support of our research activities and other mission activities and to clarify our authority to receive such funding. In all of these efforts NOAA will work to ensure that there are no real or perceived conflicts of interest in connection with leveraging of resources.

Question 4. Could you describe the comprehensive cooperative research and management program called for in MSA section 318, including operating documents and how the program is funded? Concerning funding, identifying budget items for the program by funding class would be particularly helpful.

Answer. NOAA has established a cooperative research program that has effectively engaged and benefited from collaborations with a broad range of external stakeholders. Through this program, NOAA has increased the quantity and quality of data; inclusion of stakeholders' knowledge in science and management; improved relevance of research to fisheries management; and reduced costs of science. Additionally, this program has and continues to promote a shared understanding of science and support for management decisions by stakeholders and improved relationships with constituents. If confirmed as Administrator, I will continue to support cooperative research as a key component of our fisheries science enterprise.

Question 5. Many cooperative management efforts have focused on improving monitoring in specific fisheries, and have used technology—electronic reporting or monitoring systems—to aid these efforts. Please describe NOAA's legal, technical, and operational considerations in implementing electronic reporting (vessel trip reports, logbooks, landing receipts) and electronic at sea monitoring and how the current rule-making on these issues can insure that these technologies are adopted in more U.S. fisheries.

Answer. There are a number of challenges to incorporation of electronic monitoring, including:

- Law enforcement procedures (*e.g.,* to ensure proper chain of custody of video)
- Confidentiality policies (*e.g.,* needed to govern all acts observed on video)
- Information technology infrastructure improvements (*e.g.,* data transmission and storage needed for broad scale implementation)
- Funding (*e.g.,* identifying the exact costs and source of funding for implementing electronic technologies)
- Technology advances (*e.g.,* improving image recognition)
- Moving from pilot projects to full implementation (*i.e.,* scalability)

NOAA is currently evaluating electronic technologies for use in data collection and monitoring to provide timely, accurate, and cost-effective information. The regional offices and science centers are reaching out to regional councils, fishermen, and other stakeholders to address these challenges and to identify, evaluate, and implement these new technologies where appropriate to improve fisheries data reporting and monitoring. I am committed to NOAA being a world-class science agency, and as such, we must adapt as technology advances. If confirmed as Administrator, I would continue to make this a top priority.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. MARIA CANTWELL TO DR. KATHRYN SULLIVAN

International Pacific Halibut Commission

Question 1. The National Oceanic and Atmospheric Administration (NOAA) oversees the appointment process for the International Pacific Halibut Commission (IPHC). Mr. Bob Alverson, a halibut fisherman from Seattle, was nominated to be a Commissioner on the IPHC for the non-Alaska seat. Recreational, commercial and tribal Pacific halibut fisheries provide jobs to fishers, outfitters, processors, seafood retailers and shipyards throughout the Pacific Northwest. According to the IPHC's Annual Report, the sport halibut fishery is second only to salmon, with landings reaching over 370,700 pounds in 2010. In addition, the commercial halibut catch on the West Coast was 407,600 pounds supporting many commercial fishing jobs in our coastal communities, in the Puget Sound and in ports up the Columbia River.

Despite Pacific halibut's importance to our coastal economies, the NOAA has failed to appoint commissioners. Mr. Alverson has been waiting over a year and a half to hear from the Department.

Dr. Sullivan, much of this delay has occurred during your tenure as Acting Administrator at NOAA. By what date will you have commissioners selected, and notified of their selection? In your role as Administrator, how will you prevent long, costly, drawn out appointment processes in the future?

Answer. I absolutely understand how critically important this fishery is to both Washington and Alaska, and if confirmed, I assure you that working closely with the White House to get these Presidential appointments through the process quickly will be a high priority for me.

Shark Finning and NOAA Overreach

Question 2. Shark populations globally are declining at alarming rates. My home state took action on this issue by passing a law in 2011 to ban the possession and sale of shark fins—the market for which drives overexploitation of sharks worldwide. We joined a growing number of states in recognizing that the main way to combat the global slaughter of sharks is to remove the market for, and trade in, shark fins. In May of this year, however, the National Marine Fisheries Service (NMFS) issued a proposed rule in which the agency articulated a view for the first time that state laws like Washington's may be preempted by the recent Shark Conservation Act of 2010. My question for you relates to the way in which the agency handled itself in this matter.

Dr. Sullivan, Federal agencies are required under Executive Order 13132 to engage in a consultation process with states whose laws may be affected, when the agency intends to preempt state law. During your time as Acting Administrator of NOAA, *NMFS failed to consult with my state, and any other state, before issuing its proposed rule on shark fins.* Please explain how the agency was able to do this legally. Furthermore, will you give me your commitment that this will not happen again under your leadership?

Answer. Pursuant to EO 13132, NOAA did reach out to affected states prior to issuing the proposed rule to alert them that the proposed rule would identify the potential for conflicts between state and Federal law. As noted in the proposed rule and its preamble several states and territories have enacted shark fin laws. These laws differ from state to state. Some of these laws restrict the possession of shark fins in a way that could create a problem for fishermen who must land the fish caught in Federal waters with fin attached to comply with Federal law.

NOAA continues to engage in discussions with these states to work toward accommodating both Federal and state interests through the interpretation and implementation of Federal and state law. Those discussions are ongoing, including discussions with the State of Washington. We are hopeful that we can find solutions that will allow both state and Federal laws to co-exist.

Question 3. Dr. Sullivan, currently California's shark fin law, which is similar to Washington's law, is subject to litigation. Private parties from industry have challenged the law, and the State of California and interveners are defending the law. The U.S. Department of Justice filed an amicus brief in the Ninth Circuit Court of Appeals, taking the position on behalf of NMFS that the California law is preempted by Federal law. I am not weighing in on ongoing litigation, but I want to understand how NMFS has been conducting business between interested parties.

a. NMFS is currently engaged in consultation with the State of California, just as it is with the State of Washington, "in an effort to avoid . . . a conflict" between state and Federal law that would result in preemption. Executive Order 13132, 64 Fed. Reg. 43,255, 43,257 (August 10, 1999). Please explain why this aggressive action in the courts—which flatly denies any compatibility between state and Federal law—does not undermine the consultation process required by Executive Order 13132 as a way of collaboratively avoiding conflicts between state and Federal law?

Answer. As you mention, one of the states with a shark fin ban is California, whose ban became effective July 1, 2012. The Chinatown Neighborhood Association sued the State of California to enjoin that law.

Because the District Court addressed the question of Federal preemption in its opinion denying a preliminary injunction in that case, and because the topic of preemption was briefed by both plaintiff and defense, the United States submitted an amicus brief to the Ninth Circuit addressing the topic of preemption. The brief was filed on July 22, 2013 due to the fact that the Ninth Circuit Court of Appeals scheduled oral argument in this matter for August 14, 2013. The Department of Justice and NOAA had no control over the schedule in the Ninth Circuit litigation.

On August 27, 2013, the Ninth Circuit issued a limited ruling on the appeal in *Chinatown Neighborhood Association et al.,* vs. *Governor Edmund J. Brown, et al.,* which will not affect the ongoing rulemaking.

NOAA is still engaged in the rulemaking process. The public comment period on the proposed rule, which closed on July 31, 2013, allowed commenters to take the United States' views, as expressed in the proposed rule and in the amicus brief, into account in their submissions. In addition, NOAA is still actively engaged in discussions with states with existing shark fin bans to work toward accommodating both Federal and state interests through the interpretation and implementation of Federal and state law. These discussions with states, as well as comments received during the public comment period, will of course inform NOAA's final rulemaking process.

b. Will you ensure that NMFS will conduct itself in a more measured way with respect to preemption, following through with a full consultation process before taking litigation positions, under your leadership? You should know, that this type of behavior from NMFS regarding legal opinions and non-legal "white papers" (which are non-legal, legal documents prepared by NOAA's lawyers) is a pattern which creates enormous uncertainty in our states and with our stakeholders.

Answer. If confirmed as Administrator, I will certainly work to ensure that we develop productive consultation relationships and work cooperatively with our state fishery management counterparts. Our relationship with them and the compatibility of Federal and state regulations is critical to achieving successful and sustainable management of our Nation's fisheries.

Prescott Grant

Question 4. The NOAA John H. Prescott Marine Mammal Rescue Assistance Grant Program was zeroed out in the President's Fiscal Year 2014 and Fiscal Year 2013 budget requests. As you know, the Prescott Program fuels highly leveraged grants to regional marine mammal research and stranding response organizations. Over the last 13 years, the program provided funding critical to responding to over 57 unusual mortality events, facilitated stranding response for over 20,000 marine mammals, produced 120 peer reviewed scientific studies, and led to the discovery of 10 infectious diseases.

Dr. Sullivan, in your view, will NOAA be able to meet their statutory requirements of the Endangered Species Act (P.L. 93–205), the Marine Mammal Protection Act (P.L. 92–522) among other statutes, if the program is defunded? For example, how will NOAA respond to anthropogenic impacts on marine mammals such as entanglements and oil spills? In your opinion, will regional stranding response centers be able to remain open without the grant program? How will regional oiled marine mammal response capability change if these regional stranding centers are not able to remain open? As Administrator, how will you prioritize this program?

Answer. The Prescott Grant Program provides competitive grants to eligible members of the National Marine Mammal Stranding Network to rescue, rehabilitate, or investigate sick, injured or distressed live marine mammals and to determine the cause of death or disease in dead marine mammals. Following a thorough budget review to see if savings could be found through organizational and program changes, NOAA proposed to eliminate the Prescott Grant Program in FY 2013 and FY 2014 as part of the President's efforts to find efficiencies and savings in a constrained fiscal environment.

NOAA anticipates some stranding network organizations would continue to operate in the absence of the Prescott Grant program, but loss of Federal funds may reduce their ability to operate at their current level and may inhibit their ability to raise private funding through research proposals, foundations, and private donations.

NOAA places huge value on its long-standing partnership with stranding network members to obtain the vital information about marine mammal health needed to develop effective conservation programs for marine mammal populations in the wild. If confirmed as Administrator, I can assure you that NOAA will continue to try to assist network partners as much as possible. Through the FY 2013 appropriations process, $1.1 million was provided for the Prescott program. With that appropriation, NOAA was able to award 12 grants to stranding network members from 10 states totaling $1.046 million. An additional $10,866 was awarded to the National Fish and Wildlife Foundation for future emergency grants to the stranding network to be used as needed.

Climate Change

Question 5. Climate change is impacting our oceans in a number of ways: from warming, to sea level rise, and ocean chemistry. Understanding how climate change is impacting species, ecosystems and processes has proven to be a challenge—especially in the marine environment.

Dr. Sullivan, how do you view your new role as the NOAA Administrator with respect to climate research, education and outreach? How could NOAA help communities, businesses and policy makers better understand how climate change will impact human health, transportation, weather, and coastal economies?

Answer. If confirmed as NOAA Administrator, I am committed to helping communities, businesses, and policy makers understand how climate change will impact human health, transportation, weather, and coastal communities. Our Nation must understand these impacts, so we can prepare and adapt effectively. To meet this goal, NOAA will continue its efforts to bolster its capacity to observe changes in climate, climate variability, and impacts of climate changes by sustaining our world-class observation, monitoring, research, and modeling efforts, and to understand the role of humans within the climate system. If confirmed, I will ensure that NOAA continues to produce the type of regional climate information and tools that are requested by resource managers, decision makers, and the public such as cities planning for sea level rise and storm surge, businesses seeking to make their supply chains more resilient to environmental impacts, and individuals looking to be better prepared for extreme weather events. By building upon NOAA's strong scientific foundation and working with our external and internal partners, I am committed to ensuring that relevant and credible scientific information and tools are delivered in a timely manner to communities, businesses, and policy makers needed for both mitigation and adaption of climate impacts.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. MARK BEGICH TO DR. KATHRYN SULLIVAN

Seafood Certification

Question 1. While independent certification of seafood sustainability may have started out with good intentions, these programs have come under criticism for changing goalposts and increasing costs. Alaska dropped its third-party certification of salmon in favor of United Nations FAO-based Responsible Fisheries Management (RFM) standards. Fisheries managed under the Magnuson-Stevens Act (MSA) operate under national standards for sustainability and NOAA has its Fish Watch program.

But now some buyers, including Federal agencies such as the Park Service, operate under guidelines set by other third-party certifiers. One retailer won't purchase Alaska snow crab because it is not certified by the Marine Stewardship Council (MSC) in favor of Russian crab which is known to be mismanaged and a major source of illegal crab on the world market. As a result, many Regional Fishery councils have proposed certification standards be written into the Magnuson-Stevens Act (MSA) during its ongoing reauthorization.

What are your ideas about how NOAA can better assure retailers and consumers about the sustainability our seafood products, the strict standards that exist in MSA, and how our management process of scientific-based harvest levels, monitoring and observing, and stock assessment and reassessment makes U.S. fisheries among the best managed in the world?

Answer. As Administrator, touting the success of our fisheries management system will remain a top priority. The fisheries management process established under the Magnuson-Stevens Act has established the United States as a recognized global leader in responsibly managed fisheries and sustainable seafood. NOAA is taking a proactive role in telling the story of the success of U.S. fisheries, using a variety of approaches to highlight the value, quality, and sustainability of U.S. harvested and farmed seafood, including the website *FishWatch*. *FishWatch* delivers neutral, regularly updated information on seafood harvested in the United States. The website introduces consumers to the dynamic process of sustainably managing living resources in an ever-changing ocean environment. This tool also provides factual information about the biological and ecological status of a fishery and lets users draw their own conclusions relative to satisfying a purchasing standard, based on science provided by NOAA's National Marine Fisheries Service (NMFS). We continue to improve the content of *FishWatch* and explore opportunities for expanding its reach.

In addition, to assist sellers, NOAA can issue declarative public statements in the form of letters in response to requests from harvest sector groups on whether a particular fishery is "sustainably managed" based on the Magnuson-Stevens Act National Standards. In those letters, we highlight the fact that, in the United States we have virtually eliminated overfishing and are rebuilding overfished stocks to sustainable levels in all federally managed fisheries.

Confidentiality

Question 2. In May 2012, NOAA issued a proposed rule to update current regulations and reflect changes to the information confidentiality provisions in the 1996 and 2006 Magnuson-Stevens Act reauthorizations. While the proposed rule reflects Congressional intent, fishermen are concerned the final rule may actually weaken the confidentiality provisions and allow disclosure of proprietary information that Congress intended to remain confidential.

What is the status of this rulemaking? If confirmed, will you stand by the approach in the proposed rule and preserve the Congressional intent in the 1996 and 2006 amendments to keep proprietary data confidential?

Answer. We understand the concerns fishermen are voicing about the data confidentiality provisions. We are currently evaluating the comments we received on the proposed rule and are deciding what changes should be made in the final rule. Congressional intent is fundamental and is, and will continue to be, central to our analysis as we work on the final rule.

Ocean Observing

Question 3. The Integrated Ocean Observing System (IOOS) is a great example of a successful Federal-regional partnership. In my home state, the Alaska Ocean Observing System (AOOS) works as a functional link between the state and Federal Government, supporting monitoring of ocean acidification, changing ocean conditions due to climate change, and developing data integration and visualization tools to improve safety at sea and ecosystem management. What are your plans, as the head of NOAA, to expand this capacity among the 17 IOOS agencies and ensure that IOOS program grows to its full potential?

Answer. Events over the last few years, including Sandy and the *Deepwater Horizon* oil spill, have awakened U.S. communities to the value and necessity of timely ocean information. U.S. IOOS investments in remote and *in situ* observations, environmental modeling, improved interoperability between diverse systems, and the implementation of data standards are supporting real-time decision making across the country. NOAA, as the lead Federal agency for IOOS, is using its appropriated funds to: expand access and use of ocean, coastal, and Great Lakes observing data; improve products and services through new modeling and decision support tools; maintain and improve observing capabilities at the NOAA, Federal, and regional levels; coordinate the transition of research to operations and lead training and capacity building activities; and strengthen IOOS's regional and Federal governance.

There is much more work to do to build and organize the ocean-observing infrastructure of the Nation and I look forward to working with you on this continuing challenge if confirmed.

Arctic Research Funding

Question 4. The changing Arctic is one of my top priorities as well as that of the Administration but there is concern from commercial fishermen that funding for the Arctic research is NOT be diverted from other NOAA research and monitoring in the Bering Sea and Gulf of Alaska, especially the fish surveys conducted by NOAA Fisheries. I know similar concerns are shared nationwide. How do we address increased research needs in the Arctic without jeopardizing basic NOAA research needed to manage our fisheries, forecast the weather and monitor our oceans? How would you recommend improving Federal Arctic science programs overall? Would my Arctic Research bill, S. 1344, help address these needs?

Answer. The Arctic is a unique, dynamic environment that holds great promise in both scientific research and economic development. As the resources of the Arctic become more accessible, it is important that sufficient research is conducted to provide a better understanding of the Arctic ecosystems and climate to ensure these resources are maintained responsibly. NOAA's Arctic Research Program provides invaluable data and forecasts, such as sea ice forecasts, which are critical to safe marine transportation and resource extraction activities in this dynamic environment. In a time of declining budgets, we must ensure that every penny is spent as wisely as possible. NOAA understands the importance of the Arctic and has, and will continue to, make this research a priority, and we look forward to working with you to advance our knowledge and understanding of the region. NOAA works closely with its partners to conduct Arctic research, and close collaboration and coordination will be even more important given budget realities. NOAA supports the intent of S. 1344 to facilitate Arctic research efforts and if confirmed as Administrator, I would look forward to working with you to advance our understanding of this vitally important region.

Permitting and Authorizations

Question 5. I appreciate NOAA's work in recent years to promptly issue needed permits and authorizations, such as Incidental Harassment Authorizations. Given the short summer open-water season during which much exploration and development occurs, will you continue to work to promptly process needed permits and authorizations in the future?

Answer. Yes, NOAA will continue to work with industry and our stakeholders to ensure that permit applications are processed as efficiently and thoroughly as possible.

NOAA Arctic Research Ship

Question 6. Ship-wise, do we have the right tools in the fleet to deal with the opening Arctic? We have closed the Arctic to fishing because we lack the science to properly manage the fishery. Does NOAA have the organic capability to conduct Arctic research at sea? How will we get the scientific data to manage these resources without the ability to operate in the Arctic?

Answer. The Arctic and sub-Arctic regions are already experiencing significant environmental and economic impacts from climate change. The United States must actively collaborate with other Arctic countries and international organizations to better understand and manage resources. Understanding and managing effectively in a regime of Arctic change requires significant and accurate information on Arctic marine ecosystems, marine life, ocean circulation patterns and acidification, human health and well-being in coastal communities, transportation, and other activities. NOAA's scientific capabilities can be deployed in partnership with other government agencies and academia to increase our fundamental understanding of this region. NOAA's services can also be used to support safety and security needs for transportation and energy and mineral exploration. I don't think our agency alone has the needed tools to deal with the changing Arctic; NOAA will need to continue working with other agencies and international organizations especially as budgets continue to decline and resources become more scarce.

NOAA will also be providing a more formal update to Congress about efforts to assess Fleet composition and coordination. The update will outline a path forward that addresses mission demand and provides a balanced approach as well as a 'best fit' to the Nation's needs and requirements and yields a sound return on the investment of taxpayer dollars.

NOAA Alaska Ship Staffing

Question 7. Some NOAA ships are consistently away from their homeports for more than 300 days a year, including the Alaska-based *Oscar Dyson* and *Fairweather.* Does this present challenges for staffing these ships? What is NOAA's plan to ensure these ships are effectively staffed? Is NOAA able to offer inducements such as COLAs to the wage-marine crew on ships with these arduous schedules? Are there other things the agency can to do take care of the officers and crew of ships that have no effective homeport, in addition to the normal wages and benefits that crews of all ships are eligible for?

Answer. NOAA ships are staffed by wage mariners that may choose any NOAA homeport as their duty station. In the case of both *Oscar Dyson* and *Fairweather,* the ships are staffed with a mix of personnel from a multitude of homeports, not just Alaska. Maintaining staffing is a recurring issue due to the nature of the work and time underway for most maritime fleets. NOAA has developed a robust augmentation pool of qualified personnel that rotate throughout the Fleet. While not perfect, it does mitigate most gaps due to scheduled and unscheduled leave, or loss of an employee due to retirement or resignation.

Pay for Wage Mariners is governed by Federal pay authorities, and as such are not entitled to the payment of COLA. For ships that are out of their homeport and/or underway, Wage Mariners accrue 1 day of shore leave for every 15 days out of homeport. For ships such as *Oscar Dyson* and *Fairweather,* the mariners can accrue additional shore leave above the normal wages and benefits of ships that regularly return to their homeport.

Arctic Permitting Processes

Question 8. I appreciate your comments during the hearing about the importance of interagency processes, especially for complicated environmental reviews and regulatory proceedings. What have you observed, during your time as Acting NOAA Administrator, that has worked well about the Interagency Arctic Working Group and other interagency processes? What has not worked well? Based on your observations, what specific changes will you seek to make challenging interagency process more effective?

Answer. Executive Order 13580 established the Interagency Working Group on Coordination of Domestic Energy Development and Permitting in Alaska, chaired by the Department of the Interior, to coordinate the Federal agencies responsible for overseeing the safe and responsible development of onshore and offshore energy resources and associated infrastructure in Alaska. NOAA participates in regional, staff, and Deputy-level meetings and calls. The Working Group has brought a new level of communication and coordination to our work in the Arctic. If confirmed, I look forward to continuing this close coordination.

Arctic Science and Decision Making

Question 9. Given the many syntheses that have been done compiling Arctic data and studies, combined with the ongoing data streams you have from industry and other groups, we're able to proceed with more informed decision-making.

NOAA has placed a large value on precautionary approaches, especially for the Arctic, but one reason the U.S. and companies that operate here invest so much in data acquisition and analysis is to reduce the range of scientific uncertainty and allow more informed decision-making. While this investment continues, how will you make sure that science helps shape development decisions in productive or appropriate ways? As we gain a better understanding of Arctic ecosystems and environments are we able to adjust our level of precaution?

Answer. Science is the foundation of NOAA's work and having the best available science is critical to our many missions. As we are able to hone our scientific understanding of the Arctic's ecosystems and climate, we will be able to make decisions and provide the forecasts that our stakeholders rely on based on more precise data. While all uncertainty can never be eliminated, through scientific research and discovery NOAA will be able to increase the reliability of our products. NOAA is making necessary investments to improve our understanding of the Arctic for that very reason.

Response to Written Questions Submitted by Hon. Richard Blumenthal to Dr. Kathryn Sullivan

Question 1. I keep hearing that NOAA's research budget keeps getting slashed, and at the same time that we have pressing needs for data and important questions we need to answer—whether it is questions about the status of fish stocks or what acidification and climate change mean for our shellfish farmers in Connecticut?

a. How do you see NOAA accomplishing its core mission of informing important management choices in an era of declining research budgets?

Answer. I agree that this is an area of concern as budgets are being reduced and investments in research are harder to maintain. The President's FY14 Budget Request placed a priority on research and development and the Disaster Relief Appropriations Act of 2013 Congress passed also helped make an investment in targeted research. If confirmed, I can assure you that I will continue to make research a top priority for this agency and do everything I can to make sure our core mission of science, stewardship, and service continues to inform the important management decisions we make on a daily basis.

b. Are the alternative revenue streams or budget cuts that can be made to allow NOAA to conduct the critical research that needs to be done?

Answer. I believe we need to be careful about making more cuts to our programs, since we have been experiencing those cuts for a couple of years now and actually have a higher demand for our products and services as time goes on. If confirmed, I will continue to examine ways to better leverage external funding and partnerships so the agency can continue to remain on the cutting edge of research.

Question 2. Strict new rebuilding requirements, coupled with the annual catch limit mandate, create problems achieving sustainable yield for healthy stocks coharvested in fisheries where some catch of rebuilding species is inevitable. In such instances, rebuilding stocks become “choke” species, preventing full harvest of healthy stocks and creating allocation battles. The problems Georges Bank yellowtail flounder are causing for New England haddock and scallop fishermen illustrate the situation. For instance, even though Georges Bank haddock is highly abundant, only a small fraction of its annual catch limit can be harvested. Likewise, yellowtail by-catch limits are driving scallop management decisions. Indeed, increasingly small yellowtail flounder allocations to the scallop fishery and associated accountability measures risk closing the scallop fishery in highly productive areas on Georges Bank. Conservation is important to our fishing communities, but so is the need for abundant stocks to be harvested.

a. What steps are NOAA Fisheries and the fishery management councils taking to help ensure that fishermen have access to abundant resources, such as scallops and haddock?

Answer. I am keenly aware of the need to provide access to economic opportunity while also meeting our conservation goals. NOAA has worked quickly with the New England and Mid-Atlantic Fishery Management Councils to increase catch limits when stock assessments have shown that a stock is in good condition and to open up additional fishing opportunity when possible. The New England Fishery Management Council (New England Council) has reduced minimum fish sizes for many groundfish stocks, such as haddock, to reduce discards and allow more fish to be landed. The New England Council also has provided special access programs for vessels using selective gear, so that the healthier stocks can be targeted while catching fewer fish from the less abundant stocks. In addition, we are working with the scallop fishery to develop ways to reduce bycatch so that this valuable fishery is not curtailed by low yellowtail quotas.

We are exploring options to allow sectors access to portions of areas that were closed to address groundfish fishing mortality while maintaining closures in areas needed to protect habitat, vulnerable groundfish stocks, spawning stocks, and protected species. We worked with the New England Council to increase the catch limit for Gulf of Maine winter flounder when a new stock assessment was completed and showed that the stock was no longer subject to overfishing. We moved quickly to increase quotas for redfish, white hake, and pollock, as new scientific advice became available. We have also looked for flexibility to provide additional fishing opportunities to harvest healthy fish stocks. For example, we created new exempted fishery programs to enable greater harvests of spiny dogfish, skates, and redfish, and removed possession limits on monkfish for certain trips. We will continue to look for flexibility in Federal laws and ways to provide additional fishing opportunities to harvest healthy fish stocks.

b. What flexibility can be added to the Magnuson-Stevens Act to better balance conservation with access to abundant resources, such as scallops and haddock?

Answer. NOAA is reviewing National Standard 1 guidelines to look at additional flexibilities that can be applied to fisheries management. The National Standard 1 guidelines address ending overfishing, including the requirements for annual catch limits and accountability measures, and stock rebuilding. We have taken public comments on revisions to the guidelines, and NOAA continues to analyze the issues raised by the Councils and the public. NOAA is planning to issue an options paper this winter that will discuss areas where guideline revisions may be able to provide more flexibility for the Councils and fishermen, while still meeting the requirements of the Act. I support these efforts, and if confirmed, I will continue to look for opportunities for the Agency to find flexibility while also meeting our conservation mandates.

Question 3. We have been successfully reducing over-capacity issues in our fishing fleets for nearly two decades.

a. Are we nearly where we need to be in terms of matching the fleet’s capacity with sustainable harvest levels or are further cuts going to be required?

Answer. NOAA works with fishery management councils, the industry, and other partners to reduce regulatory inefficiencies that prevent fishermen from “right-sizing” their businesses. In a fluid, dynamic fishery with sufficient flexibilities and opportunity for profit, fishermen will adjust capacity to current conditions. While NOAA has done several studies to understand the relationship between existing fishing capacity and fleet size, the results of these studies indicate that over-capacity exists, but the extent of estimated over-capacity is affected to a large degree by the estimation method. And it’s impossible to determine whether existing fishing capacity is in line with potential long-term fishery yields. We believe that fishing capacity is neither an advisable fishery management tool nor goal. It is better thought of as a result of a confluence of fishery management decisions and environmental conditions.

b. Are there other sectors where we could be putting displaced fishermen to work? When there was a net ban in Florida, training programs ushered in millions of dollars of new clam farming production.

Answer. Aquaculture is an increasingly important component of marine sustainability, in which fishermen can play a critical role. Marine aquaculture provides regional economic development, new employment opportunities for interested or displaced fishermen, and can augment commercially important species. If confirmed, I will continue to support the development of new business and training opportunities for our Nation's fishermen.

c. Should we be re-training fishermen to grow mussels or seaweed? What can NOAA do to streamline permitting for mussel farms in Federal waters? We import millions of dollars of mussels from Canada.

Answer. Mussel farming is providing important marine-based jobs for fishermen in the Northeast. NOAA recently provided a grant to support a demonstration mussel farm in Federal waters off Massachusetts. The project trains local fishermen to farm mussels and the participants are working to obtain Federal permits. In addition, Federal disaster funds were used in Maryland to train watermen in oyster farming and to provide incentives to start oyster farming ventures. This has helped lead to 40 new shellfish farms with at least half started by watermen in recent years.

NOAA is working with our federal, state, local, and tribal partners to streamline permitting processes for marine aquaculture; to provide models, decision tools, and the best available science for efficient and effective regulatory decisions; and to educate the public about the economic and ecological benefits of marine aquaculture. We intend to continue these efforts.

d. NOAA has determined that the Magnuson-Stevens Act gives it authority to regulate shellfish aquaculture activities in Federal waters. Are there any shellfish aquaculture experts or representatives on the Regional Councils? Should the Regional Fisheries Management Councils have any regulatory authority over shellfish aquaculture permitting?

Answer. The makeup of each fishery management council reflects the expertise and interests of the states in that region. While we have not specifically asked governors to nominate shellfish aquaculture experts to serve on regional fishery management councils, it is likely that some members who represent commercial fishing, seafood businesses, academia, tribes, and state and Federal agencies have relevant expertise in shellfish aquaculture.

NOAA maintains that "fishing" under the Magnuson-Stevens Act includes the harvesting of cultured fish and shellfish. If a species is included in a fishery management plan, a grower must obtain authorization from NOAA. Although this requirement does not apply to species not covered by a fishery management plan, we expect fishery management councils in regions where interest in offshore aquaculture is expanding to consider developing aquaculture fishery management plans in the future. The Gulf of Mexico Fishery Management Council took such an approach when it developed its aquaculture-specific fishery management plan. The Gulf aquaculture fishery management plan does not include any shellfish species, but it provides a good example of how a council can take a regional approach to managing commercial aquaculture in Federal waters. That said, NOAA is interested in continuing to work with Congress to explore alternative approaches that could provide the necessary regulatory clarity for aquaculture to develop in Federal waters.

Question 4. One of the issues that I hear about from shellfish farmers in Connecticut is that certain environmental regulations can pose challenges for shellfish permitting, which is a big industry in my state.

For instance eelgrass is protected as "essential fish habitat" under Magnusson-Stevens Act. Yet I hear from scientists that shellfish aquaculture provides many of the same ecosystem benefits that eelgrass provides, including improvements in habitat and water quality.

a. Should we move away from a policy that mandates "no net loss of eelgrass"—to one that says "no net loss of ecosystem function"?

Answer. NOAA does not have a formal policy on any net loss of eelgrass. Our 2011 Aquaculture Policy supports a regulatory approach that provides opportunity for the aquaculture industry, as well as protects high priority habitats that are essential to fisheries. NOAA recognizes the valuable role the shellfish aquaculture industry plays in providing sustainable seafood and ecosystem services, restoring habitats, and creating jobs in coastal communities. And we understand the value of eelgrass and its susceptibility to degradation, which have made it a priority for habitat protection through NOAA's multiple consultation mandates. Since NOAA's mandates require that it conserve aquatic vegetation and shellfish and foster sustainable aquaculture, NOAA will work with its partners to seek ways to fully consider the ecosystem services of shellfish aquaculture in the permitting process.

b. Is there a way for us to preserve biodiversity and ecosystem services while creating new jobs and providing sustainable seafood as well?

Answer. Providing sustainable seafood and creating jobs is a prime goal of NOAA and, if confirmed as Administrator, it would be a top priority of mine. In addition to striving to bring the Nation's wild fish stocks back to healthy and sustainable levels, NOAA invests in initiatives that support aquaculture as an important component of how the agency can reach this goal. There is a perception among some stakeholders of intrinsic conflict in balancing the goals of preserving biodiversity and ecosystem services and creating new jobs and providing domestic safe sustainable seafood for the Nation. However, we have many examples from the United States and around the world that show seafood can be caught and cultured sustainably. NOAA believes that increasing and diversifying our domestic seafood supply through expansion of sustainable marine aquaculture can be accomplished through careful regulation informed by sound science and technology development and transfer to U.S. seafood growers.

Question 5. Information collected by fisheries observers represents an important source of data for fishery conservation and management. For instance, observer data is used in many fisheries to track a fishing fleet's level of bycatch against its overall bycatch limits. Certain fishermen, such as scallop industry participants, are required to pay for their own observers, and that can be very expensive. I understand it can take many months for NOAA Fisheries to be able to compile and analyze data obtained from observers so these data can be used to estimate bycatch levels. As a result, fishermen can end up “flying blind” during the fishing season in terms of knowing where their catches are in relation to bycatch catch limits.

a. What more can NOAA Fisheries do to ensure observer information is accurate?

Answer. NOAA has developed national minimum eligibility standards for observers. These requirements are designed to ensure that observers are fully qualified and have the appropriate background and education needed to perform the necessary duties of an observer and to collect timely and accurate information. The National Observer Program Advisory Team, comprised of observer program managers from across the country including NOAA headquarters staff, routinely reviews the national standards to determine if improvements are needed. In addition to these requirements, all data collected by observers must go through a thorough quality assurance/quality control process.

b. What more can NOAA Fisheries do to ensure that observer information is available in time to be useful to the fishermen who are paying for it?

Answer. As described above, all data collected by observers must go through a quality assurance/quality control process to ensure the accuracy of the data. Observer programs strive to provide accurate data as quickly as possible.

The Northeast Fisheries Observer Program and other observer programs are looking into additional ways to collect and submit data electronically in order to make information available more quickly to fishermen. For example, the Northeast Fisheries Observer Program and other observer programs across the country have begun incorporating handheld devices such as rugged iPads and toughbook computers to record and submit observer data electronically through wireless networks and satellite. Data confidentiality, IT security, and manageable costs are also taken under consideration.

From a national perspective, NOAA recently approved a policy regarding the adoption of electronic technology solutions in fishery-dependent data collection programs. The NOAA policy requires each region to evaluate the adoption of electronic technologies for the fisheries in their areas of responsibility. The core principle is a regionally driven focus to promote shared information and improve coordination across regions to improve overall data collection efficiency and effectiveness. We are striving to obtain the appropriate amount and quality of data at the least cost in time and money over the long term.

RESPONSE TO WRITTEN QUESTION SUBMITTED BY HON. EDWARD MARKEY TO DR. KATHRYN SULLIVAN

Question. The home port of the NOAA ship Henry B. Bigelow is Woods Hole, Massachusetts. This is appropriate since Dr. Bigelow was a founder of Woods Hole Oceanographic Institution, and because the ship supports fisheries research from the Northeast Fisheries Science Center in Woods Hole. However, the Bigelow is currently docked in Newport, Rhode Island, unable to work out of Woods Hole due to insufficient dock infrastructure. What resources and actions are needed to bring the Bigelow home to Massachusetts?

Answer. The homeport for NOAA Ship *Henry B. Bigelow* is Woods Hole, MA, but due to the draft of the vessel, lack of funds for dredging, and pier length, NOAA Ship *Henry B. Bigelow* has not been able to use the pier facility at Woods Hole and therefore was, and still is, temporarily docked in Newport, RI, where NOAA's Office of Marine and Aviation Operations has successfully negotiated and funded the upgrades needed for use of the Navy pier through 2016. If confirmed, I will work to ensure NOAA identifies a clear path forward to address the homeport question.

Response to Written Question Submitted by Hon. Brian Schatz to Dr. Kathryn Sullivan

Question. During Secretary Pritzker's nomination hearing, I asked a question regarding an operating license amendment request before the Commercial Remote Sensing Regulatory Affairs Office that would allow an improved position for U.S. industry versus its European and international competitors, including unlicensed aerial services. She graciously offered to look into the process and work with us for a timely answer to the request.

I am advised that we are reaching the statutory end point in the review process. May I have your assurance that this process will move forward expeditiously and you will continue to be on the forefront of U.S. competitiveness in this growing market?

Answer. On May 12, 2013, a U.S. private remote sensing company requested an amendment to its license(s) to operate its commercial remote sensing space systems to sell imagery commercially at down to 0.25 meter resolution. The current resolution limits, as provided in the company's license, were established by a National Security Council Deputies Committee and therefore any decision to change the limits should be appropriately made by this Committee. Accordingly, the Department of Commerce is currently working with the Department of Defense and the Intelligence Community to schedule a National Security Council Deputies Committee meeting in the immediate future. I want to assure you that we are working this amendment request as expeditiously as possible, and if I am confirmed, I will continue to follow this process. We strongly support maintaining a competitive advantage and retaining market leadership by the U.S. commercial remote sensing industry, while taking national security and foreign policy concerns into consideration.

Response to Written Question Submitted by Hon. Martin Heinrich to Dr. Kathryn Sullivan

Question. During my state's recent catastrophic wildfires and historic floods, the local National Weather Service offices that serve New Mexico have been invaluable partners in protecting public safety by developing targeted, locally driven tools and data sets that quickly react to changing events and needs on the ground. Especially in fast-developing situations like wildfires and flash floods, the responsiveness, expertise, and accessibility of the local NWS staff has provided critically important information to local residents and first responders alike.

I understand that NOAA prefers to work with private partners, when possible, to distribute public information like weather data; however, in emergency situations where public safety is at risk, and where the effects of larger weather patterns are very different on a small scale (as happens with rain on wildfire burn scars) it seems wise to have the NWS to provide its information and locally tailored data products to citizens directly through the technologies they prefer to use, like mobile apps, rather than relying on private companies that may not have information regarding specific needs critical to public safety. NWS produces forecasts and models with great depth and detail, which are often not fully communicated in the products available from private companies.

With the widespread reliance on cell phones and other mobile electronic devices, would you consider the development of an NWS app to deliver important weather, safety, and related information directly to the American public?

Answer. At NOAA and in our National Weather Service (NWS), we recognize that this is a very important and rapidly developing area of service and technology. Wireless communication technology and the prevalent use of mobile devices have changed the way people communicate and share information on a day-to-day basis. Providing environmental information services through mobile devices using wireless communication technology to a myriad of customers and partners has the potential to increase the effectiveness of NWS warnings designed to protect life and property. NWS also supports direct delivery of information to core partners, such as those in emergency management at the state and local level, through multiple dissemination pathways. As with every new innovation, there are important factors which must be considered to ensure their effectiveness, including but not limited to meeting user needs; technological availability and requirements; and ensuring wise use of taxpayer resources, including recognizing the capabilities currently provided by a thriving public-private weather and climate enterprise. If confirmed as Administrator, I commit to working with you, our customers, and our partners on this critical area.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. JOHN THUNE TO DR. KATHRYN SULLIVAN

NOAA Mission and Fiscal Prioritization

Question 1. Dr. Sullivan, today, NOAA faces many challenges, including maintaining continuity in coverage for weather satellites, making needed improvements in fisheries management, and continuing the restoration of the Gulf of Mexico following the Macondo well blowout. And, like all Federal agencies, NOAA must adjust to new fiscal realities. This presents a real management challenge.

Given these challenges, and the growing private-sector demands for timely and accurate information from NOAA in all its mission areas, how will you prioritize and allocate limited resources across the wide span of NOAA's missions?

Answer. You are exactly right that the demands for our products are increasing while all of our missions are strained under sequestration and the uncertainty surrounding funding. In the face of declining budgets, one of my top priorities is to continue to find balance among our numerous mission areas. However, sustaining these cuts into future Fiscal Years will increase the impacts to our ability to deliver the services the Nation relies on and decrease our ability to conduct the research and development that continues to improve our services. If confirmed, addressing the immediate and ongoing challenges of sequestration and ensuring the continuity of NOAA's incredibly valuable programs will be a high priority of mine.

National Integrated Drought Information System

Question 2. Dr. Sullivan, recently, the Commerce committee favorably reported S. 376, The Drought Information Act of 2013, which reauthorizes the National Integrated Drought Information System (NIDIS). This program, with NOAA as the lead Federal agency, provides an effective drought early warning system; coordinates research in support of the drought early warning system; and builds upon existing forecasting and assessment programs and partnerships. Drought issues are always a concern in South Dakota, so drought early warning is important. What successes have come from the NIDIS program and what challenges do you see with the current program? Are you supportive of NIDIS's reauthorization?

Answer. Yes, I support the reauthorization for this very important program. Since the inception of the program in 2007, NIDIS has been providing a dynamic and accessible drought information system that enables users to determine the potential impacts of drought and the associated risks, as well as provides them with decision support tools to prepare for, and mitigate, the effects of drought. As such, the program has garnered strong user support. With 41 percent of the Nation currently suffering from drought, it is more critical now than ever before that credible information is made available in a timely manner, so that people and communities have as much time as possible to plan and respond. To meet this need, the U.S. Drought Portal—a one-stop-shop for credible and easily accessible drought information and products—has been a successful tool for both the public and private sectors.

Another successful element of NIDIS is the implementation of regional drought early warning information systems. A relatively new, but successful area of focus for NIDIS is working with livestock producers to manage risks related to drought. One specific example is a series of workshops across South Dakota on drought risk management for cattle producers that connect climatology, economics and insurance, rangeland management, vegetative health and productivity, and water resource management in a way that ranchers could use to help plan and prepare better for drought.

Much of the support that NIDIS has generated, and the program's ability to meet the Nation's needs, results from the strong partnerships that the program has with other agencies, outreach organizations, and an enabling set of programs and observational capabilities. We also hope to build on these partnerships to launch the Drought Resilience Partnership, called for in the President's Climate Action Plan, to develop new ways to deliver drought information and tools nationwide. Maintaining these critical partnerships is the biggest strength and the biggest challenge facing the program, along with declining budgets.

NOAA Satellite Programs

Question 3. Dr. Sullivan, NOAA's satellite programs, primarily run by the National Environmental Satellite, Data, and Information Service (NESDIS), comprise nearly 20 percent of the Department of Commerce's budget. The two most prominent programs, the Joint Polar Satellite System (JPSS) and the Geostationary Operational Environmental Satellite-R series (GOES–R), together accounted for one-third of NOAA's Fiscal Year 2013 budget request. Satellite program challenges have already resulted in some milestones being extended, risking gaps in critical satellite coverage and requiring careful management of resources to keep the program on track. At the same time, certain satellite programs have had a history of poor management, and, in spite of improvements, NOAA's satellite programs have been named one of the top five management challenges facing the Department of Commerce in a recent Office of Inspector General (OIG) report (Report no. OIG–13–003, November 9, 2012). Further, recent analysis by the Government Accountability Office indicates that both JPSS and GOES–R continue to be threatened by schedule slips and inadequate contingency plans (reports GAO–13–676 and GAO–13–597, respectively). Moving forward, what steps do you intend to take to ensure that NOAA can continue to provide vital environmental and weather data from these satellites?

Answer. These satellite programs are National assets which have received significant attention from the Congress and the Administration. Over the past several years, significant changes have been made to ensure the appropriate management, scope, and acquisition strategies are in place to enable these satellite programs to remain on schedule and within budget in order to meet the Nation's weather and environmental data needs. Many of these changes implemented the recommendations of the GAO, OIG, Congressional direction, and views of a group of eminent satellite acquisition experts. Over the last year, the JPSS program made significant progress, remaining on schedule and in budget and repeatedly meeting critical milestones. The JPSS program has reduced the life cycle cost to $11.3 billion by transferring non-weather instruments to NASA and other programs within NOAA, trimming content, and improving efficiency. In regards to the GOES–R Series Program, both NOAA and NASA have worked to ensure that it is executed on budget and on schedule. However, a $54 million reduction from the sequestration and rescission that was included in the enacted FY 2013 appropriations required the program to change the committed launch dates for GOES–R from the 1st Quarter of FY 2016 to the 2nd Quarter FY 2016, and to move the committed launch dates for GOES–R from the 2nd Quarter FY 2017 to the 3rd Quarter FY 2017. The Program will continue to work aggressively in order to have GOES–R and GOES–S ready as early as possible. To keep JPSS and GOES–R on schedule and within budget, we need the requested appropriations in the President's FY 2014 Budget. I can assure you I am focused on ensuring NOAA's satellites are managed efficiently and effectively and will continue to do so if I am confirmed.

National Weather Service

Question 4. Recent examples of funds being inappropriately moved around within the National Weather Service call for increased top-level attention to be paid to this important line office. The National Academy of Public Administration has released a report entitled, "Forecast for the Future: Assuring the Capacity of the National Weather Service." This report made several recommendations to move the Weather Service forward. The NWS plays a key role in South Dakota agriculture, as it does for various sectors of the economy around the nation, because at the end of the day, we all rely on the predictive weather intelligence NWS provides. What role will you play, if confirmed, in supporting the National Weather Service as it seeks to implement reforms? Are there particular reforms you would prioritize?

Answer. I am a strong believer that organizations must evolve to keep up with rapidly advancing technology and changing demands. If confirmed, my goals for the National Weather Service (NWS) are to strengthen it and to ensure it is the flexible, agile organization it must be to meet the increasing demands for the services and products it provides. I will closely follow the recommendations and advice of the NAPA report, which Congress commissioned. Any change to the NWS must be deliberate and will benefit from the input of many interested parties and experts. We have embarked on a process to plan that future. It is my sincere hope that in the coming months the dialogue with Congress, our employees, and our stakeholders can focus on how to create a more nimble organization.

Aquaculture Policy

Question 5. The United States now imports more than 90 percent of our seafood. NOAA's own Aquaculture Policy states that the agency will "encourage and foster sustainable aquaculture development." How will you work within NOAA and with other agencies to streamline aquaculture regulations so that the U.S. can capitalize on available resources and become competitive in the global aquaculture industry?

Answer. I share your support for streamlining aquaculture regulations and helping our businesses become more competitive. NOAA agrees that the development of shellfish aquaculture and other types of aquaculture has lagged behind much of the rest of the world, and that aquaculture in the United States can contribute more to the Nation's economy, seafood supply, and overall food security. That is why the President's National Ocean Policy Implementation Plan identified this issue and why we are working with our federal, state, local, and tribal partners to streamline permitting processes for marine aquaculture; to provide models, decision tools, and the best available science for efficient and effective regulatory decisions; and to educate the public about the economic and ecological benefits of marine aquaculture. We intend to continue these efforts.

Timely Communication with Congress

Question 6. Written questions for the record are an important way for our Committee Members to understand better the positions of the Departments and agencies over which we have jurisdiction. We hope that those Departments and agencies view the responses to such questions as an opportunity to further educate Members about their challenges and views.

NOAA has not been as responsive to this Committee as many of us expect. In one instance in the 112th Congress, NOAA failed to provide answers to questions for the record ten months after the questions were submitted to the agency and eventually the hearing record was closed with no NOAA response. This Congress, timeliness and responsiveness from NOAA has improved, especially following our most recent nomination hearing and confirmation of Dr. Mark Schaefer for Deputy Administrator at NOAA.

Should you be confirmed, will you do your best to ensure that communications between NOAA and our Committee and its Members are timely and accurate? In particular, I would appreciate responses to substantive questions for the record within no more than three months; in cases where official responses on that timeline are impossible, I would appreciate the agency to communicate the reason for the delay to the Committee. Will you abide by that practice?

Answer. If confirmed as Administrator, I will certainly work to ensure that communications between NOAA and Members of this Committee are timely and accurate. Our relationship with this Committee is very important to us, and we will strive to be more transparent regarding reasons for any delays.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. MARCO RUBIO TO DR. KATHRYN SULLIVAN

Question 1. As you know, accurate and up-to-date science is essential for proper fishery management. May I get your commitment to make data collection a priority within the agency?

Answer. Yes, if confirmed, I will continue to make data collection in support of our fishery management structure a priority for NOAA. Investment in fisheries science directly supports the Administration's mission to conserve and manage coastal and marine ecosystems by improving the quality of the science available to manage commercial and recreational fisheries for sustainability and optimum yield, thus supporting coastal communities and the U.S. economy both today and for the future.

Question 2. NOAA recently proposed listing 66 coral species as endangered species by estimating the health of the species over the next 100 years. While I understand we are in the early stages of the process, I am concerned about the potential economic impact this listing may have on recreational fishermen and businesses in Florida. May I get your commitment to work with my office as the agency moves forward with this listing?

Answer. If confirmed, you have my commitment to work with your office as NOAA continues through this listing process. As you know, NOAA's proposed listings under the Endangered Species Act for 66 coral species and reclassification of two additional species is one of the most complex listing processes the agency has ever undertaken. NOAA published our proposed rule on December 7, 2012, and we continue to work diligently on our final determination, reviewing the numerous public comments received during the public comment period and at 18 public hearings conducted during that time. We recently announced a six-month deadline extension from December 2013 to June 2014 for the final determination deadline for all 66 species to ensure our final determination is based on the best scientific and commercial information available. We will continue to work with your office throughout this process.

Question 3. As you know, the Subcommittee has begun the process of working to reauthorize the Magnuson-Stevens Act. Should you be nominated what policies would you highlight and prioritize in the reauthorization?

Answer. The Administration has not taken a formal position on reauthorization. However, the work that NOAA does to support the multi-billion dollar commercial and recreational fishing industries is critically important to the economy. The Magnuson-Stevens Act (MSA) has been very successful in ending overfishing and rebuilding fisheries and has established the United States as a recognized global leader in responsibly managed fisheries and sustainable seafood. This success is a product of hard work and ingenuity by the industry and a sound Federal fishery management system. Still, we also realize that there can always be improvements to the way we do business. As we move forward, I believe we should do so in a very open and deliberate way to ensure that we do not undermine the success we have seen thus far, while addressing the problems that confront our fisheries today.

We understand there is substantial interest from stakeholders and Congress on potential legislative changes to the MSA. We have begun the process of talking to stakeholders and plan to continue to engage with external partners and Congress on how we can improve management of Federal fisheries, be it through policy or regulatory changes or statutory changes.

Question 4. Are you concerned that regulatory policies could negatively impact the commercial remote sensing industry in the U.S.? What policies do you advocate to ensure U.S. industry continues to be the frontrunner in Commercial Remote Sensing?

Answer. The Department of Commerce supports the 2003 U.S. Commercial Remote Sensing (CRS) Policy which sets the goal to “advance and protect U.S. national security and foreign policy interests by maintaining the Nation’s leadership in remote sensing space activities, and by sustaining and enhancing the U.S. remote sensing industry.” The Administration reaffirmed its strong support of the U.S. commercial remote sensing industry in the 2010 U.S. Space Policy.

The Department of Commerce is currently working with the other interested U.S. Government agencies to determine any appropriate changes that may help the U.S. commercial remote sensing industry maintain a competitive advantage and retain market leadership while taking national security and foreign policy concerns into consideration. If confirmed as Administrator, I will work with the Secretary and other interested U.S. Government agencies to strike the balance between protecting U.S. national security interests while supporting the growth of this important U.S. industry.

Question 5. Please describe how you plan to implement the National Ocean Policy.

Answer. The National Ocean Policy (NOP) coordinates and aligns coastal and ocean-related actions of Federal agencies to bolster our ocean economy, improve ocean health, support coastal communities, strengthen our security, and access the best available information to ensure we are using our ocean resources to the maximum benefit of all Americans. We have heard from coastal communities, ocean industries and stakeholders that they are looking for an easier way to navigate the various ocean-related authorities, missions and decision-making processes of Federal agencies. Because NOAA is primarily an ocean agency, most of our existing, mandated authorities support the activities outlined in the NOP Implementation Plan. But there are still many decisions that require the coordination of agencies and issues. In this regard, the Plan enhances NOAA’s ability to identify areas of improved cooperation, shared priorities, information sharing and decision making to control costs and strengthen ocean, coastal, and Great Lakes stewardship. In addition, the Plan enhances NOAA’s ability to implement our existing statutory authorities, using existing resources, to identify specific actions to bolster our ocean economy, improve ocean health, support local communities, strengthen our security, and access the best available information. NOAA will also take advantage of the Federal coordination framework to ensure that existing resources are applied in a way that complements other Federal programs, so that people on the ground realize the maximum benefits from Federal programming and funding. Ultimately, the NOP bolsters NOAA’s ability to respond to the most pressing challenges facing our Nation’s oceans and the businesses, communities, and people that rely on them.

Question 6. The next benchmark stock assessment for red snapper in the South Atlantic is expected to be complete in 2014 after a one year delay. May I get your commitment that this assessment will stay on schedule?

Answer. Yes, this assessment will stay on schedule. It will begin with a data workshop in August 2014, timed to enable inclusion of the 2013 data and will be completed with a review workshop in June 2015.

RESPONSE TO WRITTEN QUESTION SUBMITTED BY HON. LISA MURKOWSKI TO DR. KATHRYN SULLIVAN

Question. Can you confirm that NOAA Fisheries is working with the small boat fixed gear fleet in Alaska to develop an Experimental Fisheries Permit to further develop electronic capabilities? Please identify the steps the agency is taking to ensure this EFP will be in place for 2014.

Answer. I share your desire to see more electronic monitoring capability in our fisheries. On May 3, 2013, NOAA issued an Electronic Technology Policy Directive that directs our Regional Offices and Science Centers to work with partners and stakeholders to create regional plans to identify, evaluate, and implement (where appropriate) electronic reporting and monitoring technology.

I am aware that there are efforts underway in Alaska to develop an application for an Exempted Fishing Permit (EFP) that would allow for small boat fishermen to use electronic monitoring in place of human observers. I also understand that the North Pacific Fishery Management Council is prepared to discuss this topic at its October meeting, should an application be submitted. The staff in NOAA's Alaska Regional Office have met with the group developing the EFP and provided feedback and guidance on their efforts. Should an application be received, sufficient time is needed for evaluating the scientific study plan and completing the required analysis prior to the December 2013 Council meeting.

I agree that this technology will provide options for monitoring that may help fishermen—and especially small boat fishermen that do not have the space to carry an observer. We want to implement electronic monitoring as fast as possible—but need to ensure that the data we get are accurate and reliable. If confirmed, I will continue to make this a priority and will update you and your staff on our progress.

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